COAL AGE

Vol. 9 NEW YORK, JUNE 10, 1916 No. 24

# THE TROUBLE MAKER

**It's exceedingly difficult to put your finger on him, and when you do he's equally difficult to deal with. This is true because he frequently is just right enough to have seeming justice on his side.**

THE trouble maker takes a small irritation and elevates it into a grievance and succeeds, after a time, in convincing a great many of his fellow workers that it is a serious grievance.

For example, the pitboss may be a man of somewhat abrupt and brusque ways, given, perhaps, to small outbursts of profanity now and then. Most men, knowing the pitboss, accept these manners as merely characteristic of the man and fail to grow excited about them so long as the boss is otherwise reasonably just and decent.

But the trouble maker seizes upon these faults of the boss and insistently magnifies and emphasizes them until they loom larger in his mind than the manifest virtues and the competent powers of an excellent executive. And gradually he talks other men into the same frame of mind, until finally there is widespread dissatisfaction with the boss, leading sometimes to smoldering hate and ugly rancor.

Thus the mine and the boss and the men suffer purely through a state of mind induced by a trouble maker. He is perfectly right in contending that the boss is brusque, profane and abrupt—and that makes it so much the more difficult to show that he is wrong in magnifying these qualities out of all proportion to their relative importance.

It is by such methods that the trouble maker works. By nature a stirrer-up of strife, he always finds an absolutely logical annoyance or irritation upon which to base his activities. And his specialty is helping other men to discover a grievance in what they would otherwise have considered merely a bothersome incident not worth worrying about.

There is really a tremendous difference between the trouble maker and the agitator. Sometimes you find them both in one person, but ordinarily the agitator occupies himself kicking about things worth complaining of—even if he may not be justified in the lengths to which he goes—while the trouble maker apparently makes trouble for sheer delight, rarely showing himself as a leader in the row he starts.

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THE agitator is a leader who makes war in the open—the trouble maker is a skulker who hides in the crowd he incites. The best way to deal with either of them is to make the working conditions of employees so good that they will eliminate the discontent breeders themselves. This plan isn't so difficult as it sounds, for substantial justice is really about all most laboring men want.

(Written expressly for Coal Age by Berton Braley.)

# Accidents Due to Carelessness

[This is the fifth installment of articles describing actual instances where the results of carelessness have been serious and in many cases fatal. It is the everyday occurrences that are soonest forgotten. This campaign for safer mining is based on the idea that knowledge of the mistakes made by others is the best way to prevent similar disasters in our own lives.—Editor.]

## Miners Imprisoned Eighteen Hours

By William L. Tyrrell*

In the No. 7 colliery, Tylor's Town, Wales, on one Saturday morning there occurred an accident that is worth recalling for the benefit of *Coal Age* readers. The mine was gaseous, and the district we were working was unusually fiery. The main airway in this mine was so blocked that it was very unsatisfactory, and one day about four months previous, when acting as a miners' inspector, I had condemned it. When making this inspection, I had been obliged to crawl on my hands and knees for about 1,000 ft.

The coal company contemplated putting in a new airway, and at one point had started to withdraw timber. On the Saturday morning in question we sat just outside of this spot and spoke of the chances we were taking. Just as we were going back to work, a driver came in with an empty car and told us that the place had caved behind him.

We all knew that there was only one way out, and we immediately started working in relays to try and clean a passage through the fall. We knew that our comrades would be working on the other side, although we could not hear them until well on in the afternoon. By that time our water had played out and our strength was fast leaving us. All of a sudden we heard another great noise, and we realized that a second fall had occurred between us and safety. Our safety lamps went out one by one, and soon we were in total darkness.

Although we knew our friends were still working toward us, it seemed as though every minute was an hour, and worst of all was the realization that our dilemma was the result of our own neglect and carelessness.

About 9 o'clock we heard tapping again. Five hours later we were rescued, and although we all came out alive, some of the men were unable to get about for several days. Pulling timbers is precarious work and should not be undertaken unless every precaution is observed.

*Carbondale, Penn.

## Runaway Cars on Incline

By H. L. Handley†

A great many men do not take to the safety-first idea because it is too much trouble at times to use the safety devices. Several years ago I was employed as engineer on the installation of a long endless-rope haulage system on which we were trying out several new types of rope grips for attaching the cars to the rope. I had installed a spring latch derail on the loaded track near the bottom of the plane as a protection to the tipple should a runaway occur.

One Sunday morning before the system had been put into working order, the outside superintendent decided that he would try some experiments on his own hook. Not knowing of the derail, he ran a train of cars through it and caused himself a great deal of trouble. After clearing up the wreck, he ordered the derail spiked shut so that it could not be opened.

On Monday morning when I arrived on the job I heard about the affair, but allowed the rope to be started before the derail was opened. A short time after the rope started a car broke loose some distance up the incline and tearing several other cars loose with it, came rushing down the track into the tipple.

The derail was spiked and could not be opened in time to prevent the cars going to the tipple. The roof and equipment were torn from the top of the tipple, and a number of men on the tipple had narrow escapes.

†Ruth, Nev.

## The Danger of Naked Lights

By W. L. Morgan*

Not so very long ago two mine examiners were killed and two certificated mine managers were seriously burned in three separate accidents in different Illinois mines. This seems almost impossible, but it is true nevertheless. Every one of these men knew the danger connected with mine gases. They all knew just how much air is required to render a certain gas inexplosive. Each of them knew the danger of a gas explosion and the effect of afterdamp on the unfortunate victims. They could have answered almost any reasonable question concerning the treatment of men burned by an explosion or overcome by gases. They knew full well the consequences that might result from bringing a naked light into contact with an explosive atmosphere.

The question naturally follows, why did such men take a carbide light with them when making rounds in a district subject to an excess of explosive gases?

In three separate cases the intention was to take the carbide light to the danger zone, then extinguish it and make the examination with a safety lamp, only relighting the carbide light when the danger zone was passed. In each case the danger zone was miscalculated. In the first accident a feeder was reported the day previous in one of the entries. Other feeders of gas were discovered in several rooms. It is generally believed that the mine examiner intended to take his naked lamp as far as the last open crosscut, then leave it there and go ahead with his safety lamp. It was undoubtedly his idea that on his return from the face of the entry he could again pick up his naked light. But he miscalculated the danger zone owing to the extra feeders in the rooms, with the result that he was killed.

In the case of the second accident a fall of roof had occurred in a room, releasing a large quantity of gas. There was no crosscut into this room, and the gas worked itself out toward the entry. The mine examiner

*East St. Louis, Mo.

on his rounds ignited this gas with his carbide light, and he also was killed. Again the danger zone was miscalculated.

In the third accident a fire had been sealed off at the back entry inside of the last open crosscut. Explosive gas oozed out over the top of the stopping. The nearest crosscut being nearly finished, was cut through, and it was then found that the fire was out. The workers went to lunch without opening the other stopping, which would have allowed the current to clear the gas away.

The back entry being full of gas inside the stopping and the hole being made into this back entry, the gas naturally diffused into the main entry. The mine manager and his assistant a little while later, on their way back from lunch with their carbide lights on their caps and safety lamps in their hands, came to the last open crosscut and touched off the escaping gas. The manager was severely burned and his assistant badly scorched.

These men acknowledged later that on their way back they were talking and miscalculated the location of the last open crosscut.

The lesson from these accidents is plain—an open light should be absolutely prohibited on any person who intends going into any part of a mine where explosive gases are likely to be present. If we are to have safety first at our mines, it must commence with our officials. All accidents should have the widest publicity. All men, whether miners or company officials, should be severely punished when they are found guilty of any violation of mining laws or local mining rules. We not only need safety laws, but we need officials who have backbone enough to enforce them.

## Foreign Miner Killed by Roof Fall

By Pennsylvania Miner

A foreign miner was engaged in drawing pillars in a Pennsylvania bituminous mine. The mine foreman, on passing this man's working place, discovered that the miner needed a number of props to make his room safe. He immediately instructed him to prop his place and supplemented these instructions by telling the driver who furnished cars to this room to bring in the necessary timbers.

On the next trip in the driver delivered to the miner a load of props. The foreigner unloaded the props, but did not set any of them. His plan was to finish loading a car that he had already started to fill with coal. In a few minutes there was a loud report, and when the near-by miners reached the foreigner's working place, they found him under a fall of slate. Two weeks later he died, leaving two little children, who were taken to the county home.

Another accident I remember resulted from a wager between two drivers as to which of them could make a trip the quickest. One of the men rode on the hind end of his trip. Starting down a heavy grade, he found it necessary to apply brakes, and accordingly rushed to the front cars, setting the brakes on one car. The sudden stopping caused one of the cars to be derailed, and the driver was crushed between another car and the rib of the entry. He lived four hours after the accident.

## Failed To Sound Roof

By Thomas Coates

In the year 1909 at No. 4 mine of the Delaware & Hudson Colliery, Plymouth, Penn., a careful German miner about 50 years of age worked in a pitching place, pitching about 35 deg. He robbed the pillar coming back. The roof was very bad, and from six to ten props had to be changed daily as they were apt to break. He finished the place without an accident.

On May 21, 1909, he was given a place on the level. The first day he started, the foreman came along and asked him how the roof was. He sounded it and it seemed to be all right. He thanked the foreman for giving him a place to work in where the roof was good.

An hour later the foreman was sent for, and when he reached the place the laborer told him that they had fired a heavy hole. The miner went back at once and, without sounding the roof, climbed upon the pile of coal to see what the shot had done, when a slab of rock fell upon him and he died before aid could reach him.

A second's forethought would have saved this miner's life and the sorrows of his family.

## Blasting with Electric Battery

By John Parker*

We had an accident occur where we were using an electric battery for blasting purposes. A place was being driven where three holes had been drilled in the bottom coal. The working face was square. The shot placed in the center of the face was the cutting shot and was drilled on an angle so as to allow it to break. Another shot was located in behind the cut shot. The two holes were about 2 ft. 6 in. apart in front and about 4 ft. apart at the back. They were deep.

Holes Nos. 1 and 2 were charged with three sticks of No. 2 Monobel powder in each hole and were tamped with not less than 18 in. of clay. It was decided to fire only the cut shot, or No. 1 hole. The two wires connected to the detonator of the No. 2 shot were rolled up and pushed in the No. 2 hole so as to make sure that they would not get broken from the first shot.

We connected the lead wires to the detonator wires of the No. 1 shot and then to the battery. When everything was in shape, the switch was closed and the shot went off. The lead wires were disconnected from the battery, and we were advancing to the working face to connect the No. 2 hole, when we were surprised to hear a second shot. It was then decided to wait and see what had taken place. After waiting a short while until the smoke had cleared away, we proceeded to examine the place and found that both shots had exploded. From the time we heard the first explosion until the second report not more than one minute could have elapsed.

Will *Coal Age* readers kindly give their opinions of how this may have occurred?

**The Use of Slack Coal Is Increasing Rapidly** due to the fact that most of the railroads, particularly in the Middle West, are putting automatic stokers in their new locomotives. During the past six months 2,000 tons per day consumptive requirements have changed from mine-run to screenings. It seems certain that in the next five years many locomotives will be burning screenings and this will be distinctly beneficial to the coal man.

*Issaquah, Wash.

# An Underground Mine Stable

By Guy E. Greer*

*SYNOPSIS—Details of a stable that complies with the general coal-mining laws and embodies a number of ideas of a practical nature. A proper home for horses and mules promotes both efficiency and longevity in the animals. The essentials are fireproof construction, good drainage and good ventilation. Stable should be on a separate split of air.*

The state mining laws and a growing disposition on the part of coal operators generally to consider the comfort and safety of livestock employed underground have invited considerable attention to the proper construction of underground stables. There can be no doubt that it pays from a commercial point of view to provide proper quarters for animals used in the mines. Horses and mules, if properly stabled and cared for, will not only give more efficient service, but their life will be considerably prolonged.

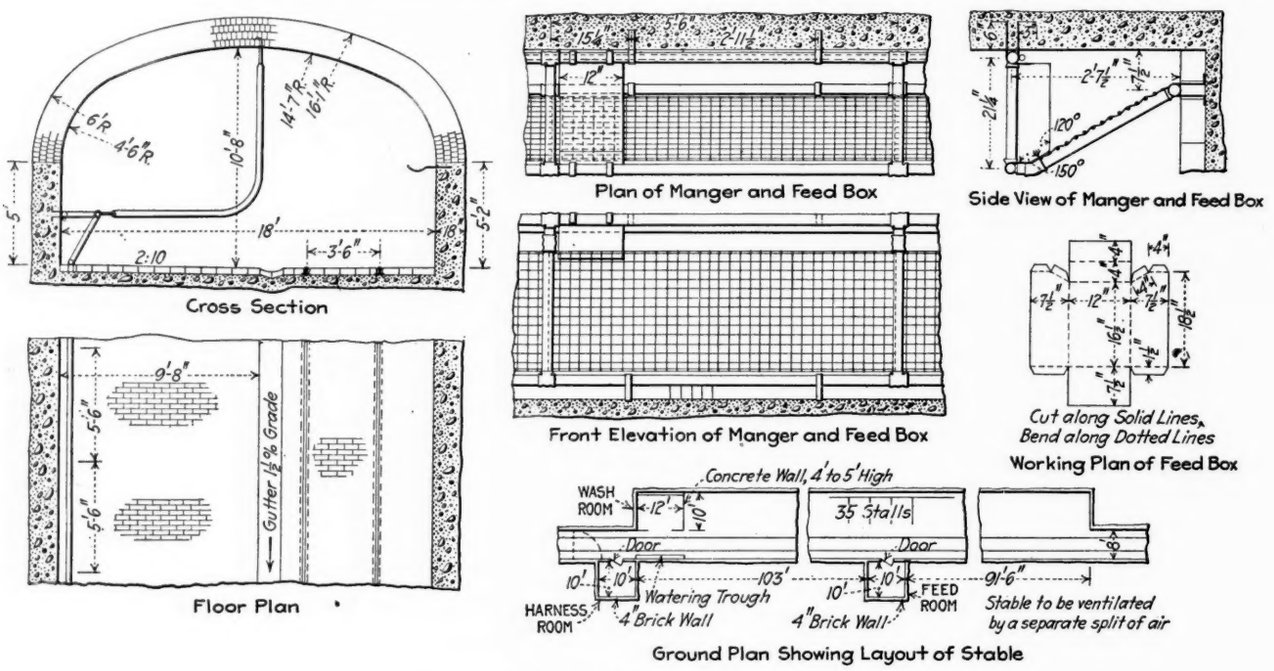
The fundamental requirements for an underground mine stable are good drainage, ample quarters, fireproof construction and good ventilation. Concerning the first two no comment is necessary. Of the latter two it might be said that the mining laws in practically all the states make provision for both. The West Virginia law provides that the walls and roof shall be fireproof and that the stables shall be on a separate split of air.

The underground stable shown in the accompanying illustration is designed to meet the needs of mine owners who wish to construct a stable which is thoroughly modern, conforming to all the requirements of the mine law, and one which at the same time will not be too expensive to permit of its being built.

The drainage from each stall is obtained by a grade of 2 in. in 10 ft. from the manger to a gutter running along the back of the stalls. (Dr. Charles A. Leuder, professor of veterinary science at West Virginia University, states as his opinion that a slope of from 3 to 4 in. in 10 ft. will not be harmful to a horse or mule standing in a stall over night.) The gutter should have a slope of at least 1½ per cent. This can usually be secured naturally by the location of the stable. If this grade cannot be obtained easily, the gutter may be made deep enough at one end to afford the proper slope. In this case all or a part of it should be covered. The gutter leads to a sump from which the water is pumped or drained naturally to the main sump.

At the entrance to the stable is a washroom with concrete floor and walls, the latter being from 4 to 5 ft. high. This may be made to drain either to the center or to one corner and from thence to the sump. The horses or mules are thoroughly washed here by means of a hose while they are being watered. Plenty of clean water for this purpose is usually available from water rings around the shaft. If it is deemed expedient, a small reservoir in connection with the water rings may be constructed at a point sufficiently high to secure plenty of pressure. A water pipe runs the full length of the stable, with taps for connecting a hose at points convenient for washing out the stalls. An additional watering trough is placed opposite the washroom for convenience in watering the animals as they are taken out in the morning.

The stalls are 5 ft. 6 in. wide and 7 ft. 8 in. long exclusive of the mangers. This gives space ample for


Cross Section
Floor Plan
Plan of Manger and Feed Box
Front Elevation of Manger and Feed Box
Side View of Manger and Feed Box
Cut along Solid Lines, Bend along Dotted Lines
Working Plan of Feed Box
Concrete Wall, 4' to 5' High
WASH ROOM
35 Stalls
Door
Watering Trough
4" Brick Wall
FEED ROOM
HARNESS ROOM
Stable to be ventilated by a separate split of air
Ground Plan Showing Layout of Stable

DETAILS OF A MODERN MINE STABLE

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the comfort of even the largest size of horse used in the mines. From the back of the stalls to the track the distance is 2 ft. 3 in. Between the track and the wall there is 2 ft. 7 in. of clearance. This allows plenty of space for a large feed truck.

### Details of Wall and Roof Construction

The side walls are of concrete and are 18 in. thick This gives a good substantial wall which is easily built. The roof is an elliptical four-ring brick arch, this type being recommended because it gives the maximum of useful space in proportion to the excavation required. Brick is used because it is believed that an arch may be more readily constructed underground of this material than of concrete.

The floor is of paving brick carefully laid with cement mortar on a 6-in. concrete base. This is used instead of concrete because it is believed that it wears better and gives a better surface for the animals to stand on. Dr. Charles A Leuder, who has been referred to before, states that the hardness of a brick or concrete floor will not be harmful to a horse or mule. No attempt will be made here to enter into an argument as to the respective merits of concrete and brick as a flooring material. I have seen both materials in use and apparently giving excellent satisfaction. One of the best-equipped shaft mines in the Connellsville field in Pennsylvania has an underground stable floored with brick. Another uptodate plant in the Fairmont region in West Virginia has a stable with a concrete floor. If concrete is desired, it will be a simple matter in this design to leave out the brick and put the proper surface on the concrete.

The mangers and feed boxes are simply and substantially constructed of 1½-in. gas pipe, 27x32-in. sheet-iron plates and 2-in. mesh wire screen, securely held in place by means of straps embedded in the concrete wall and sub-floor. Standard pipe fittings are used, and no difficulty should be encountered in constructing these mangers.

### System of Ventilation

Ventilation is secured by means of a box regulator placed at the back of the stable. This should be so arranged that it can be conveniently closed when the animals are first brought into the stable in the evening, in order that drafts may be kept away from them while they are cooling off. This should be reopened in about half an hour and allowed to remain open all night. The stable is located so as to secure a separate split of air from the intake. This can usually be arranged without difficulty. Owing to the fact that the partitions between the stalls consist of gas pipes suspended from the roof and mangers, the entire stable is open to a free sweep of air, which insures fresh air for the animals even when lying down.

This form of partition is in use at the Continental No. 1 mine of the H. C. Frick Coke Co. The stable boss at this mine states that there has never been any trouble owing to the horses kicking each other and that the partitions are entirely satisfactory. If any difficulty is anticipated, it is suggested that the partitions be made more secure by suspending from the gas pipe a wire screen similar to that used in the construction of the mangers. This, when hung, will resemble somewhat the danger signals commonly used by the railroads to warn trainmen of the nearness of an overhead bridge or tunnel.

Owing to the wide variation in different localities of the cost of labor and materials, no attempt has been made to estimate accurately the cost of the stable. However, a bill of material based on one stall is furnished with the drawings. An approximate estimate of the cost of such a stable with 35 stalls, computed on what is taken as an average of labor conditions in West Virginia, is $3,800. This of course does not include excavation, as it would be impossible to estimate this without a knowledge of the thickness of the seam and other conditions.

## Cost of Spur Tracks

Among the items easily overlooked in estimating the cost of a coal yard or a small mine is the spur track. In some cases this includes a trestle for the gravity delivery of coal in the case of the yard. In the following tabulation, taken from *Power,* are given in round numbers some recent costs of this kind for various lengths of track, according to Massachusetts practice.

TRESTLE AND SPUR; LENGTH, 778 FT.

(Construction: Timber on Concrete Piers. Trestle About 160 Ft. Long)

| | | | | |
|---|---|---|---|---|
| Excavation | 202 cu.yd. | @ | $0.50 | $101 |
| Concrete in piers and abutments | 208.5 cu.yd. | @ | 5.75 | 1,199 |
| Timber in trestle, including ties on trestle, 40 M bd.ft. | | @ | 60.00 | 2,400 |
| Ellis bumper (1) | | | | 70 |
| Ladder (1) | | | | 4 |
| Earth-filling | 4,200 cu.yd. | @ | 0.31 | 1,302 |
| Ties | 314 | @ | 0.59 | 185 |
| Rails, 75-lb. T. (Laying) | 778 ft. track | @ | 0.25 | 194 |
| Rails, 75-lb. T | 17.36 tons | @ | 30.63 | 532 |
| Joints, continuous | 52 | @ | 1.64 | 85 |
| Spikes | 4.1 kegs | @ | 4.10 | 17 |
| Teaming on track material | 26 tons | @ | 1.25 | 32 |
| Total | | | | $6,121 |

SPUR TRACK; LENGTH, 458 FT.

| | | | | |
|---|---|---|---|---|
| Grading | 425 cu.yd. | @ | $0.50 | $212 |
| Ballast | 275 cu.yd. | @ | 0.75 | 206 |
| Ties | 229 | @ | 0.52 | 119 |
| Rail, 75-lb. T, 458 ft | 10.16 tons | @ | 28.54 | 290 |
| Joints | 20 | @ | 0.88 | 18 |
| Spikes | 2.8 kegs | @ | 4.10 | 11 |
| 75-lb. split switch with frog No. 6 | | | | 100 |
| Track laying | 458 ft. | @ | 0.25 | 114 |
| Teaming on track material | 23 tons | @ | 1.50 | 34 |
| Total | | | | $1,104 |

SPUR TRACK; LENGTH, 693 FT.

| | | | | |
|---|---|---|---|---|
| Grading, earth | 682 cu.yd. | @ | $0.30 | $205 |
| Ballast, cinder | 234 cu.yd. | @ | 0.25 | 58 |
| Ties | 304 | @ | 0.51 | 155 |
| Rail, 60-lb. T | 10.79 tons | @ | 28.54 | 308 |
| Joints | 60 | @ | 0.65 | 39 |
| Spikes | 4 kegs | @ | 4.10 | 16 |
| Switches and frogs | | | | 202 |
| Tracklaying | 693 ft. | @ | 0.25 | 173 |
| Teaming on track material | 17 tons | @ | 1.25 | 21 |
| Total | | | | $1,177 |

SPUR TRACK; LENGTH, 562 FT.

| | | | | |
|---|---|---|---|---|
| Ballast | 73 cu.yd. | @ | $0.75 | $55 |
| Ties | 281 | @ | 0.52 | 146 |
| Rail, 56-lb. T | 9.32 tons | @ | 28.54 | 266 |
| Joints | 24 | @ | 0.62 | 15 |
| Split switch and frog | | | | 75 |
| Spikes | 3.3 kegs | @ | 4.10 | 13 |
| Tracklaying | 562 ft. | @ | 0.25 | 140 |
| Teaming on track material | 12 tons | @ | 1.25 | 15 |
| Total | | | | $725 |

TRESTLE AND SPUR TRACK; TOTAL LENGTH 394 FT.

Spur Track About 170 Ft. Long

| | | | | |
|---|---|---|---|---|
| Excavation | 206 cu.yd. | @ | $0.75 | $154 |
| Concrete | 146 cu.yd. | @ | 7.00 | 1,022 |
| Timber | 64 M bd.ft. | @ | 45.00 | 2,880 |
| Grading | 204 cu.yd. | @ | 0.50 | 102 |
| Ballast | 23 cu.yd. | @ | 0.75 | 17 |
| Ties, 8-ft. chestnut | 85 | @ | 0.54 | 46 |
| Rail, 58-lb. T | 6.70 tons | @ | 31.04 | 208 |
| Switches and frog | | | | 105 |
| Bumper (1 Ellis) | | | | 70 |
| Joints | 30 | @ | 0.65 | 19 |
| Spikes | 2.1 kegs | @ | 4.10 | 8 |
| Tracklaying | 394 ft. | @ | 0.25 | 98 |
| Teaming track material | 24 tons | @ | 1.25 | 30 |
| Total | | | | $4,759 |

# Underground Mine Roads--II

By J. McCrystle*

*SYNOPSIS—This article, which is the second of the series, embodies rules from the book of rules which should be furnished to the trackmen, foremen and assistant foremen and with which they must be familiar. These rules may be altered or modified periodically, as experience may dictate.*

During the past decade the necessity of a standard practice in the installation of the narrow-gage tracks in common use in and around mining plants has been growing more evident. This want now being felt by the coal companies was met some years ago by the standard-gage roads in the incorporation of a "Book of Rules" for the guidance of their maintenance-of-way employees—books embracing standard plans for turnouts, approved forms of ballast, drainage, etc., and definite instructions regarding the duties of each person concerned.

The present paper, which embodies the foundation of such a set of rules for mining use, has been confined to trackwork, but the scope of such a book should be broadened eventually to include tables, standards and rules for government in the underground construction work and routine, with chapters on safety, first aid and fire prevention, also information pointing out the best method of procedure in a typical case. There are a number of ways of doing almost anything—scientific management (so-called) has shown the advantages of selecting and perfecting one method and performing in their logical sequence the several operations involved.

The following are some of the rules which should be embodied in a book of rules furnished to the workmen who will be expected to follow them:

### (A) GENERAL RULES

1. The foreman of each colliery must supply copies of these rules and standards to the trackmen and repairmen; and the assistant foreman must enforce obedience to them and report to the district superintendent all violations and the action taken thereon. Every employee with duties in any way prescribed by these rules must be conversant with them.

2. The fact that any person enters or remains in the service of the company will be considered assurance of willingness to obey its rules.

3. In the event of any doubt as to the meaning of any plan, or if additional information is required, application should be made to the district engineer.

4. Meetings will be held at least once every three months by the district superintendent, where a review will be taken of the various rules, and suggestions for alterations, improvements or additions to the existing standards received.

5. Safety is of prime importance in the performance of any duty; every precaution must be taken to avoid accident to the workmen themselves or others.

6. Workmen are responsible for the care and condition of their tools.

7. All work must be left in a safe condition.

8. Any work that interferes with the safe passage of trips at their normal speed is an obstruction and, except in emergencies, should be attempted only after working hours.

9. Material must not be piled along the sides of haulageways.

10. Only such an amount of material must be stored inside as is required for immediate consumption, and care must be taken to place this so as to permit free passage on the ditch side of the gangway.

11. Tools and special material must be kept under lock and key and not given out or loaned without proper authority.

12. Plans for any work not covered by the attached standards will be furnished upon application to the district engineer. Employees in charge of the work should be provided with these plans and the work executed in accordance therewith.

### (B) ROADBED

1. The roadbed on all new work should conform to the standard plan as regards ditch and clearance.

2. The ditch should be driven full width and depth at the same time as the gangway or tunnel and maintained clear by the party driving same within 25 ft. and 40 ft. of the face, respectively.

3. The district superintendent will determine what material shall be used for roadbed. Ballast is graded as follows: (1) Broken stone, excellent; (2) breaker slate, good; (3) cinders, fair; (4) coal and refuse, poor.

4. Where rock is used for ballast, it must be broken to a size that will pass through a 2½-in. ring.

5. All main haulage roads should have at least 3 in. of ballast beneath the tie.

6. All main haulage roads must be ballasted with broken rock.

### (C) TIES

1. Ties must be laid 16 to a 30-ft. rail, at right angles to the rail and properly and evenly spaced.

2. Where ties are not of uniform length, the ends of the ties on the ditch side of the track should be 1 ft. from the web of the rail.

3. Selected ties should be used on all main haulageways.

4. The standard square ties with graded lengths, conforming with both the turnout and main tracks, should be used at all turnouts and switches, except at locations where heaving of the roadbed is apparent.

5. Joint ties should be selected and should be as near as possible the same size.

6. Ties should be laid, if possible, with the exterior rings of the grain upward.

7. When a spike is drawn from a tie, the hole should be plugged before the spike is again driven.

8. As ties become unfit for service, they should be removed in the manner known as "spotting" and not in continuous sections.

9. Ties removed should be loaded and taken out of the mine at once.

10. All ties must be well tamped and particular attention given to tamping under the rail.

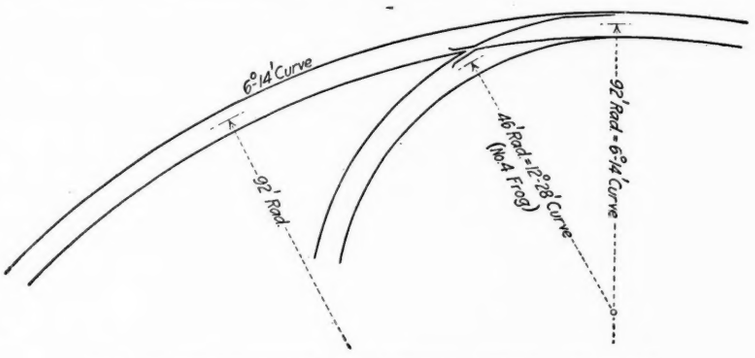



FIG. 7. ONE CURVE BRANCHING FROM ANOTHER

11. On account of drainage considerations, the practice known as corduroying—that is, inserting new ties between those partially rotted and not removing the rotted ties—must not be employed except in cases where mule haulage only is in service.

### (D) LAYING RAIL

1. Rails must be laid with broken joints; that is, the joints of one line should be as nearly opposite as is practicable, the centers of the rail, on the opposite line.

*Minersville, Penn.

2. Short rails are only advisable for temporary work. No rail under 12 ft. in length is permitted on haulage roads.

3. Joint fastenings must be applied with the full number of bolts, washers and nuts, screwed up and kept tight.

4. Rails must be spiked in full and each spike driven home perpendicularly with full hold on the rail. The last blow should be a light one to avoid breaking the spike under the head.

5. The spikes should be staggered; that is, the outside spikes of both rails must be toward the same side of the tie and inside spikes toward the opposite side, but none of them less than 1½ in. from the edge.

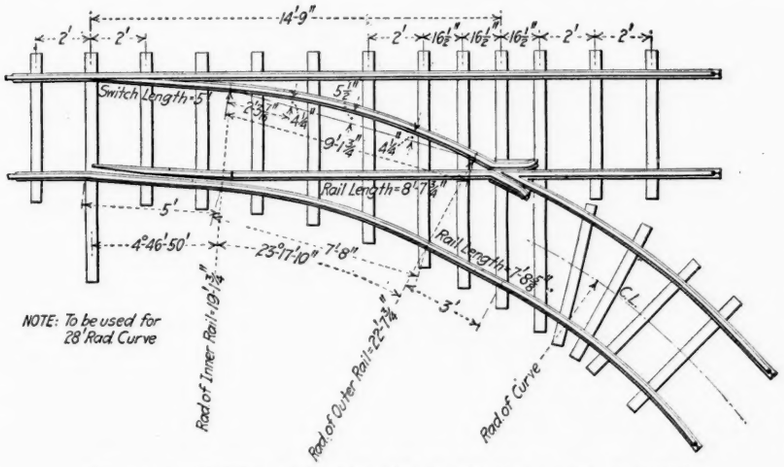



FIG. 8. PROPER METHOD OF PLACING A NO. 2 FROG

6. The gage on straight track and all curves where middle of a 20-ft. chord is less than ½ in. should be 3 ft. 6 in.

7. On curves where middle ordinate of a 20-ft. chord is:

½ in., the gage should be 3 ft. 6¼ in.
1 in., the gage should be 3 ft. 6½ in.
1½ in., the gage should be 3 ft. 6¾ in.
2⅛ in., the gage should be 3 ft. 6⅞ in.
2⅝ in., the gage should be 3 ft. 6⅞ in.
3⅛ in., the gage should be 3 ft. 6¾ in.
3⅝ in., the gage should be 3 ft. 6⅝ in.
4 in., the gage should be 3 ft. 7 in.
4 in. and over, the gage should be 3 ft. 7 in.

The gage in no case should be more than 3 ft. 7 in.

8. On straight track rails must be on the same level except on approaches, where proper elevation must be given to the outer rail of the curve.

9. The superelevation for the outer rail for maximum velocity allowed underground (6 mi. per hr.) must be:

For a 40-ft. radius curve, 2½ in.
For a 50-ft. radius curve, 2 in.
For a 60-ft. radius curve, 1¾ in.
For a 70-ft. radius curve, 1½ in.
For a 80-ft. radius curve, 1¼ in.
For a 90-ft. radius curve, 1⅛ in.
For a 100-ft. radius curve, 1 in.
For a 120-ft. radius curve, ⅞ in.
For a 140-ft. radius curve, ¾ in.
For a 160-ft. radius curve, ⅝ in.
For a 200-ft. radius curve, ½ in.

The radius may be found by measuring the middle ordinate of a 20-ft. chord and referring to Table 2.

10. The superelevation shall be run out 1 in. in every 20 ft. where practicable.

11. The track level must be tested frequently and always used when surfacing track.

12. The motorman shall report the location of any poor roadbed, and all derailments and the cause thereof to the assistant foreman.

## (E) CURVES

1. Lines will be given by the engineers for all tunnels and rock curves, and no tunnel or curve shall be started without such a line.

2. It is the duty of the assistant foreman to see that all lines are rigidly adhered to.

3. When the line given for any tunnel or curve is located at a point where the ribs or roof is bad, the district engineer should be notified as to the advisability of moving same to a more favorable site.

4. A 40-ft. radius curve is the minimum curve allowed.

5. When curves are necessary in following the irregularities of a vein in a gangway, the first set of timber must not be set up more than 4 in. in the dark of the preceding two sets, and the remaining sets not more than 8 in. in the dark of any two preceding sets.

## (F) FROGS AND SWITCHES

1. The number of the frog must agree with the radius of the curve turned.

2. The number of any frog for use underground must not be less than 2 nor greater than 4.

3. A No. 2 frog should be used with a 28-ft. radius curve; a No. 2¾ frog with a 50-ft. radius curve; a No. 3 frog with a 60- to 90-ft. radius curve, and a No. 4 frog with a 90- to 112-ft. radius curve.

4. A No. 2 frog should be adopted only in blind or shifting switches, and temporary work. A No. 2¾ frog should be used for all turnouts and for use in general. A No. 3 frog should be employed in conjunction with a No. 2¾ frog when turning to opposite gangways. A No. 4 frog should be laid on main bottom or shaft turnouts and in special cases.

5. The frog must be placed to conform to the ribs of the curve and not necessarily to the nearest rail joint.

6. The lead of a frog to be located on a curve should be the same as the number frog adopted calls for—that is, no difference should be made in the lead whether the turnout is off a tangent or curve.

7. When the frog is located on a curve, the sum of the degree of curve of the main track and the degree of curve corresponding to the frog should not exceed 14 deg. The degree of curve of the main track may be found by measuring the ordinate of a 20-ft. chord and referring to Table 2. (See Fig. 7.) The degree of curve corresponding to the frog number may also be taken from Table 2.

8. A 7½-ft. split switch should be used in conjunction with frogs Nos. 2¾, 3 and 4. A No. 5 switch should accompany a No. 2 frog.

9. The rails connecting the frog and the heel of the switches should conform to the length shown on the standard layout drawings; the one rail should be bent to the required radius and both should be drilled, and a supply kept constantly in stock.

10. The distance from the switch to the frog must agree with the standards, so as to make the connecting rails interchangeable.

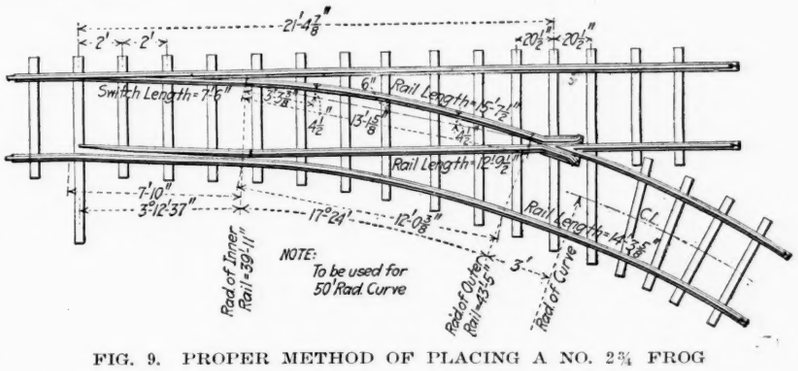



FIG. 9. PROPER METHOD OF PLACING A NO. 2¾ FROG

11. Where possible, the switch lever should be placed on the ditch side of the gangway.

12. The use of tongue points is not permitted on new installations.

13. The switch with spring should be used at all main switches; for general use, the type without the spring must be employed.

14. The switch and spring must be kept clean and well oiled.

15. When a turnout is to be laid, a complete set of material should be delivered to the proper location in ample time.

16. Bills for material:

FOR NO. 2 FROG

1—No. 2 Frog
1—5 ft.-switch, tie rods, plates and lever complete
1—9 ft. 2½-in. rail curved and drilled
1—8 ft. 7½-in. straight rail, drilled
1—6x6x8 ft. 6-in. switch tie
1—6x6x5 ft. 8-in. tie
1—6x6x5 ft. 10-in. tie
1—6x6x6 ft. 0-in. tie
1—6x6x6 ft. 6-in. tie
1—6x6x7 ft. 1-in. tie
1—6x6x8 ft. 0-in. tie
1—6x6x8 ft. 9-in. tie
1—6x6x9 ft. 6-in. tie
1—6x6x10 ft. 4-in. tie
80 hook spikes
7 pairs angle bars
28 bolts, washers and nuts complete

FOR NO. 2¾ FROG

1—No. 2¾ frog
1—7½-ft. switch, tie rods, plates, and lever complete (specify with or without spring)
1—15 ft. 7½-in. rail curved and drilled
1—12 ft. 9⅝-in. straight rail drilled
1—6x6x8 ft. 6-in. switch tie
1—6x6x5 ft. 7-in. tie
1—6x6x5 ft. 9-in. tie
1—6x6x5 ft. 10-in. tie
1—6x6x5 ft. 11-in. tie
1—6x6x6 ft. 1-in. tie
1—6x6x6 ft. 4-in. tie
1—6x6x6 ft. 10-in. tie
1—6x6x7 ft. 4-in. tie
1—6x6x8 ft. 0-in. tie
1—6x6x8 ft. 7-in. tie
1—6x6x9 ft. 3-in. tie
1—6x6x9 ft. 11-in. tie
104 hook spikes
7 pairs angle bars
28 bolts, nuts and washers complete

FOR NO. 3 FROG

1—No. 3 frog
1—7½-ft. switch, tie rods, plates and lever complete (specify with or without spring)
1—16 ft. 10⅛-in. rail curved and drilled
1—13 ft. 7¼-in. straight rail drilled
1—6x6x8 ft. 6-in. switch tie
1—6x6x5 ft. 7-in. tie
1—6x6x5 ft. 8-in. tie
1—6x6x5 ft. 9-in. tie
1—6x6x5 ft. 10-in. tie
1—6x6x6 ft. 1-in. tie
1—6x6x6 ft. 5-in. tie
1—6x6x6 ft. 9-in. tie
1—6x6x7 ft. 2-in. tie
1—6x6x7 ft. 9-in. tie
1—6x6x8 ft. 4-in. tie
1—6x6x8 ft. 9-in. tie
1—6x6x9 ft. 2-in. tie
1—6x6x9 ft. 7-in. tie
1—6x6x10 ft. 1-in. tie
120 hook spikes
7 pairs angle bars
28 bolts, nuts and washers complete

FOR NO. 4 FROG

1—No. 4 frog
1—7½-ft. switch, tie rods, plates and lever complete (specify with or without spring)
1—18 ft. 4¼-in. rail curved and drilled
1—17 ft. 8¼-in. straight rail, drilled
1—8 ft. 6-in. switch tie
1—6x6x5 ft. 7-in. tie
1—6x6x5 ft. 8-in. tie
1—6x6x5 ft. 10-in. tie
1—6x6x5 ft. 11-in. tie
1—6x6x6 ft. 1-in. tie
1—6x6x6 ft. 3-in. tie
1—6x6x6 ft. 6-in. tie
1—6x6x6 ft. 10-in. tie
1—6x6x7 ft. 2-in. tie
1—6x6x7 ft. 6-in. tie
1—6x6x7 ft. 11-in. tie
1—6x6x8 ft. 5-in. tie
1—6x6x8 ft. 9-in. tie
1—6x6x9 ft. 1-in. tie
1—6x6x9 ft. 6-in. tie
1—6x6x9 ft. 10-in. tie
1—6x6x10 ft. 3-in. tie
144 hook spikes
7 pairs angle bars
28 bolts, nuts and washers complete

17. The switch should be laid as indicated and not bent.

(G) GRADES AND DRAINAGE

1. Grade must be maintained evenly and not in a succession of flats and rises.

2. Dead or flat spots, in wet gangways, especially, will not be permitted.

3. The assistant foreman must see that all ditches and box drains are kept clear.

4. The assistant foreman will see that the proper grade board is used.

(H) WIRING AND BONDING

1. The repairman must report at once any breaks made in the continuity of the bonding or return circuit, to the assistant foreman.

2. The motorman shall report any bad portions of wiring or bonding to the assistant foreman.

3. The assistant foreman shall report bad wiring or bonding at once to the foreman and chief electrician.

4. All trolley-wire hangers must be installed true with the track and at practically the same height (7 ft.) from the top of the rail.

5. Trolley frogs must always be placed on branches leaving the main trolley at 10 to 12 ft. from the point of switch, held in place by properly placed hangers on the line near the frog and must be adjusted until a smooth curve is attained.

6. Do not attach a guy wire to any electric line without placing a strain insulator in the guy wire.

7. Care must be taken in all cases to provide sufficient clearance so the trolley does not touch the roof or timber.

8. Standard sleeves must be used for all splices.

9. The current shall be cut off whenever possible at night and during idle time.

10. Bonding should be placed on the inside of the rail and the rails crossbonded every 100 ft.

11. The bonding must be maintained at least as far as the wiring, and within 50 ft. of the face where a cable motor is used.

12. All wiring shall be done on approved insulators.

13. Hangers should be placed not more than 10 ft. apart for low roof, nor more than 25 ft. at a maximum.

Referring to Rule D6, many trackmen are opposed to increasing the gage on curves, basing their argument on the frequency with which they have to reduce the gage because of the widening effect of the traffic of the cars. Furthermore, the gage of the car wheels, especially those turning loose on the axle, is usually below that on the cars when new.

This is confusing the result with the cause. A car traveling around a curve does not move, as is commonly supposed, concentric to the axis of the curve, but in a series of short tangents, the lengths of which are governed by the radius, the speed of the cars, the increase in the gage allowed, the wheelbase of the cars and the bevel of the wheel treads. The less the excess in the gage of the rails over the car wheels, the more numerous will be these short tangents and the greater the wear on the curve and car wheels. It is the result of this movement that extends the gage of the rails and reduces that of the wheels, without mentioning the amount of extra power consumed while the cars and curves are accommodating

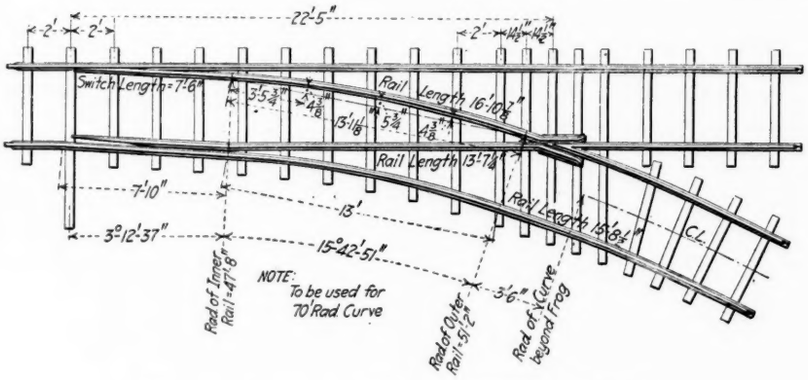



FIG. 10. A NO. 3 FROG, PROPERLY PLACED

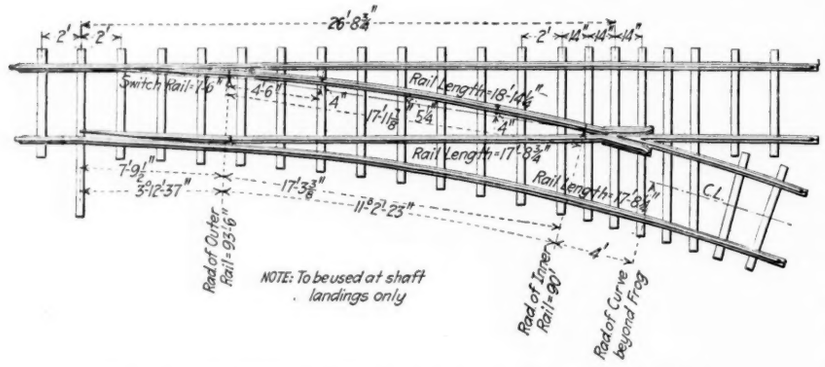



FIG. 11. PROPER METHOD OF PLACING A NO. 4 FROG

themselves to each other. If it were not for the limiting effect of the wheel treads, a larger increase in the gage than the rule stipulates should be given.

Furthermore, with wheels keyed on the axle, the larger gage permits the bevel or coning of the wheel tread to assist in overcoming the extra length of the outer rail.

While the rules must be enforced when possible on the original disposition of the track, the adjustments covered by rules D 7, 8 and 9 are to be made by the trackman when the

road is finally converted to a main haulageway. Rules E5 and F7 are in harmony with the policy of having the minimum radius not less than 40 ft.

Table 2 is an adaptation of the standard-gage practice, which is not applicable to small mine curves. Instead of the arbitrary 100-ft. chord subtending a 1-deg.

TABLE 2. RADII, ORDINATE AND FROG NUMBERS

| Radius, Ft. | Degree of Curve Deg. | Min. | Middle Ordinate of 20-Chord Ft. | In. | Frog Number | Radius Ft. | Degree of Curve Deg. | Min. | Middle Ordinate of 20-Chord Ft. | In. | Frog Number |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 | 14 | 20 | 1 | 3 | 2¼ | 76 | 7 | 33 | 0 | 7¾ | .. |
| 42 | 13 | 40 | 1 | 2¾ | .. | 78 | 7 | 21 | 0 | 7½ | .. |
| 44 | 13 | 2 | 1 | 1⅝ | .. | 80 | 7 | 10 | 0 | 7¼ | .. |
| 46 | 12 | 28 | 1 | 1¼ | .. | 85 | 6 | 45 | 0 | 7 | .. |
| 48 | 11 | 58 | 1 | ⅞ | .. | 90 | 6 | 22 | 0 | 6¾ | .. |
| 50 | 11 | 28 | 1 | 0 | 3 | 92 | 6 | 14 | 0 | 6½ | 4 |
| 52 | 11 | 2 | 0 | 11½ | .. | 95 | 6 | 2 | 0 | 6¼ | .. |
| 54 | 10 | 38 | 0 | 11⅛ | .. | 100 | 5 | 44 | 0 | 6 | .. |
| 56 | 10 | 14 | 0 | 10⅝ | .. | 105 | 5 | 28 | 0 | 5¾ | .. |
| 58 | 9 | 53 | 0 | 10¼ | .. | 110 | 5 | 13 | 0 | 5½ | .. |
| 60 | 9 | 34 | 0 | 10 | .. | 115 | 4 | 59 | 0 | 5¼ | .. |
| 62 | 9 | 15 | 0 | 9⅞ | .. | 120 | 4 | 47 | 0 | 5 | .. |
| 64 | 8 | 58 | 0 | 9½ | .. | 130 | 4 | 25 | 0 | 4½ | .. |
| 66 | 8 | 41 | 0 | 9¼ | .. | 140 | 4 | 6 | 0 | 4¼ | .. |
| 68 | 8 | 26 | 0 | 8⅞ | .. | 150 | 3 | 49 | 0 | 4 | .. |
| 70 | 8 | 12 | 0 | 8⅝ | .. | 160 | 3 | 35 | 0 | 3¾ | .. |
| 72 | 7 | 58 | 0 | 8¼ | 3½ | 170 | 3 | 22 | 0 | 3½ | 5 |
| 74 | 7 | 45 | 0 | 8⅛ | .. | 180 | 3 | 11 | 0 | 3¼ | .. |
| | | | | | | 190 | 3 | 1 | 0 | 3⅛ | .. |
| | | | | | | 200 | 2 | 52 | 0 | 3 | .. |

$$\text{Radius} = \frac{5.0}{\sin \frac{1}{2} \text{ degree of curve}}$$

$$\text{Degree of curve} = \frac{573}{\text{radius}} \text{ — (Approximate)}$$

curve with a radius of 5,730 ft., this has been decimally reduced for curves under 200-ft. radius and the analogy of a 1-deg. curve with a radius of 573 ft. and a 10-ft. chord is secured. This places at the trackman's disposal the use of all the tables in the standard railroad handbooks, by merely moving the decimal point.

## Vessels Destroyed and Building

Approximately 2,462,259 gross tons of ships, representing about 1,216 vessels in all classes and types and flying the flags of sixteen different nations, have been destroyed as a result of the war operations on the sea during the 21 months from Aug. 1, 1914, to May 1, 1916. This is the result shown by a carefully compiled record of ships lost due to various causes arising from the war, including the cables down to that date.

This total compares with a loss of approximately 990 vessels of a gross tonnage of 1,878,003 down to the end of 1915, and indicates that the rate of destruction has increased during the last four months as compared with the preceding 17-month period. The Allied tonnage destroyed to date is greater than the total lost up to Jan. 1, 1916, while the loss of neutrals is far in excess of that of the Teutonic Powers. As compared with the losses to Allied shipping, the damage to Teutonic tonnage has been comparatively light, as indicated by the following tables:

ALLIED SHIPPING DESTROYED

| Nation | Gross Tons |
|---|---|
| Great Britain | 1,571,293 |
| France | 190,289 |
| Italy | 71,443 |
| Russia | 42,258 |
| Belgium | 25,858 |
| Japan | 16,015 |
| Total gross tons... | 1,917,161 |

NEUTRAL SHIPPING DESTROYED

| Nation | Gross Tons |
|---|---|
| Norway | 147,580 |
| Holland | 82,629 |
| Denmark | 40,653 |
| Sweden | 37,896 |
| Greece | 15,017 |
| Spain | 14,550 |
| United States | 10,377 |
| Total gross tons... | 348,702 |

TEUTONIC SHIPPING DESTROYED

| Nation | Gross Tons |
|---|---|
| Germany | 165,006 |
| Turkey | 18,150 |
| Austria-Hungary | 13,240 |
| Total gross tons | 196,396 |

The returns compiled by Lloyd's Register, which only take into account vessels of 100 tons and upward the construction of which has actually begun, show that there were 424 merchant vessels of 1,423,435 tons gross under construction in the United Kingdom at the close of the quarter ended Mar. 31, 1916. The tonnage now under construction in the United Kingdom is about 60,000 tons more than that which was in hand at the end of last quarter, but about 164,000 tons less than the tonnage building twelve months ago. Shipping interests point out that the rate of progress in merchant ship construction continues to be very much reduced in the present circumstances, and that the immediate output will be considerably less than that which would be obtained under normal conditions.—*The Journal of Commerce.*

## Coal Statistics for Milwaukee

The Milwaukee Chamber of Commerce has issued the following statistics concerning the coal business at that place:

COAL SHIPMENTS FROM MILWAUKEE FOR THREE YEARS

| Shipped By | 1915 Anthracite | 1915 Bituminous | 1915 Total | Total 1914 | Total 1913 |
|---|---|---|---|---|---|
| C., M. & St. P. Ry | 249,887 | 672,932 | 922,819 | 763,132 | 394,734 |
| C. & N.-W. Ry | 210,074 | 410,908 | 620,982 | 581,908 | 495,100 |
| Soo Line | 39,358 | 72,747 | 112,105 | 135,865 | 104,003 |
| Lake | ..... | 490 | 490 | 5,345 | 6,762 |
| Totals | 499,319 | 1,157,077 | 1,656,396 | 1,486,250 | 1,000,599 |

COAL LAKE FREIGHTS FROM BUFFALO TO UPPER LAKE PORTS IN CENTS

| Months | Milwaukee 1915 | Milwaukee 1914 | Chicago North 1915 | Chicago North 1914 | Chicago South 1915 | Chicago South 1914 | Duluth 1915 | Duluth 1914 |
|---|---|---|---|---|---|---|---|---|
| March | 30 | 30 | 40 | 40 | 45 | 45 | 30 | 30 |
| April | 30 | 30 | 40 | 40 | 45 | 45 | 30 | 30 |
| May | 30 | 30 | 40 | 40 | 45 | 45 | 30 | 30 |
| June | 30 | 30 | 40 | 40 | 45 | 45 | 30 | 30 |
| July | 30 | 30 | 40 | 40 | 45 | 45 | 30 | 30 |
| August | 30 | 30 | 40 | 40 | 45 | 45 | 30 | 30 |
| September | 30 | 30 | 40 | 40 | 45 | 45 | 30 | 30 |
| October | 30 | 30 | 40 | 40 | 45 | 45 | 30 | 30 |
| November | 30 | 30 | 40 | 40 | 45 | 45 | 30 | 30 |
| December | 30 | 30 | 40 | 40 | 45 | 45 | 30 | 30 |

COAL RECEIPTS AT MILWAUKEE FOR FIVE YEARS

| From | 1915 | 1914 | 1913 | 1912 | 1911 |
|---|---|---|---|---|---|
| Buffalo | 984,968 | 950,701 | 1,028,491 | 834,131 | 909,080 |
| Erie | 194,525 | 191,646 | 153,602 | 367,527 | 90,342 |
| Oswego | 103,466 | 88,509 | 79,150 | 64,213 | 65,166 |
| Cleveland | 575,180 | 676,776 | 570,599 | 357,232 | 219,852 |
| Ashtabula | 288,556 | 354,149 | 486,739 | 242,297 | 446,330 |
| Lorain | 642,922 | 576,868 | 722,098 | 766,897 | 848,687 |
| Sandusky | 564,443 | 597,903 | 599,752 | 532,065 | 369,601 |
| Toledo | 1,251,285 | 1,237,635 | 1,228,153 | 1,180,596 | 1,453,631 |
| Fairport | 101,391 | 66,740 | 27,853 | 48,037 | 107,803 |
| Huron | 38,135 | 173,953 | 129,068 | 144,966 | 64,780 |
| Conneaut | 120,334 | 34,332 | 201,863 | 44,727 | 30,150 |
| Other Ports | ..... | 1,366 | 1,402 | ..... | ..... |
| Total tons by lake | 4,865,205 | 4,950,578 | 5,228,770 | 4,582,688 | 4,605,422 |
| Total tons by rail* | 405,340 | 409,516 | 631,493 | 589,569 | 409,489 |
| Total receipts | 5,270,545 | 5,360,094 | 5,860,263 | 5,172,257 | 5,014,911 |

* Including car ferries.

WHOLESALE PRICES OF COAL AT MILWAUKEE DURING THE YEAR 1915

| Months | Anthracite, Egg, Stove and Nut | Pocahontas, Screened | Cannel, Kentucky | Steam Coal Splint | Screened Hock | Screened Yough | Mine-Run, Pocahontas |
|---|---|---|---|---|---|---|---|
| January | $6.85@7.10 | $5.00 | $6.75 | $3.40 | $3.40 | $3.40 | $3.25 |
| February | 6.85@7.10 | 5.00 | 6.75 | 3.40 | 3.40 | 3.40 | 3.25 |
| March | 6.85@7.10 | 5.00 | 6.75 | 3.40 | 3.40 | 3.40 | 3.25 |
| April | 6.35@6.60 | 4.75 | 6.75 | 3.40 | 3.40 | 3.40 | 3.25 |
| May | 6.45@6.70 | 4.75 | 6.75 | 3.40 | 3.40 | 3.40 | 3.25 |
| June | 6.55@6.80 | 4.75 | 6.75 | 3.40 | 3.40 | 3.40 | 3.25 |
| July | 6.65@6.90 | 4.75 | 6.75 | 3.40 | 3.40 | 3.40 | 3.25 |
| August | 6.75@7.00 | 4.75 | 6.75 | 3.40 | 3.40 | 3.40 | 3.25 |
| September | 6.85@7.10 | 4.75 | 6.75 | 3.40 | 3.40 | 3.40 | 3.25 |
| October | 6.85@7.10 | 4.75 | 6.75 | 3.40 | 3.40 | 3.40 | 3.25 |
| November | 6.85@7.10 | 4.75 | 6.75 | 3.40 | 3.40 | 3.40 | 3.25 |
| December | 6.85@7.10 | 5.00 | 6.75 | 3.40 | 3.40 | 3.40 | 3.25 |

Reported by the Lehigh Valley Coal Sales Co. Prices are f.o.b. cars.

**A Heavy-Duty Anthracite Pumping Plant**—The Coal Brook and Powderly collieries of the Hudson Coal Co. have a pumping capacity of 17,500 gal. per min. The company pumped during 1914 3,000,000,000 gal. of water and produced from these operations aproximately 900,000 tons of coal. The weight of the water pumped amounted to 15,000,000 tons.

*They've Argued the Question of Safety First—*

# Does It Pay?

By Rufus T. Strohm

*Written expressly for Coal Age*

*The Manager Deems it Tommyrot—*

They've argued the question of "Safety First,"
And many have praised it and some have cursed,
Since each who derides it or takes its part
Is prompted by that which lies next to his heart.

ASK the manager who's striving
For a record yield of coal,
Urging, pleading, cursing, driving,
With the dollar as his goal,
And his answer to the query,
Quite as probably as not,
Shows the subject makes him weary—
That he deems it tommyrot.

He will brook no interference
That will make production drop,
So he wastes no time on clearance
In the setting of a prop;
Seldom pauses for repairing
Rotten ties and broken bars
Till they have an adverse bearing
On the output of his cars.

What if faulty timbers shatter,
Bringing death to half a score?
That is but a trifling matter—
He can find a dozen more.
Homes and hearts where grief has entered
Never move his narrow soul,
For his very life is centered
On the profits from the coal.

His religion's haste and hustle,
And his god the god of Greed,
So he strains with mind and muscle
To accelerate the speed;
Driving always fast and faster,
Caring naught for life or limb,
He is callous to disaster—
Men are only wops to him.

# Yes, It Pays

ASK the question of the miner,
Now a crushed, misshapen hulk,
Once so proud that none were finer,
Stronger, sturdier of bulk;
Hear him tell of how his maiming
Came about through fall of roof,
And the thing that safety's claiming
Will demand no better proof.

When you've vainly wrought and wrangled
Over what its merits are,
Ask the fellow who's been mangled
'Twixt a timber and a car;
He will show that care in spacing
Of the timbering and track
May increase the cost of placing,
But that safety pays it back.

Ask the chap who chanced the danger,
Fearful of the time he'd waste,
If he'd sooner be a stranger
Now, to safety or to haste;
Sound the man who used his grinders
For the capping of a fuse,
Whether certain rough reminders
Hadn't crystallized his views.

Turn to those whom blasts have shattered,
Bent and broken, blind and lame,
Bodies bruised and torn and battered,
Burnt with powder, seared with flame;
Then, in face of attestation
Such as these poor cripples raise,
Let none try repudiation
Of the fact that safety pays.

*Mangled 'Twixt a Timber and a Car—*

There's more to the business of mining coal
Than shoveling lumps from a murky hole,
And health and content in a thousand ways
Add weight to the statement that safety pays.

*Sound the Man Who Used His Grinders—*

# West Virginia Mining Institute

SPECIAL CORRESPONDENCE

*SYNOPSIS—The West Virginia Mining Institute held a meeting at Bluefield which was in every way as successful as such affairs usually are. Addresses were given above the average merit. The next winter meeting will be held at Huntington, W. Va.*

West Virginia need not feel discouraged about its institute. It is no better perhaps, and certainly no worse, than those in other states. If it is short of funds, that is no new trouble, and while discouraging, poverty is only a slight misfortune and by no means a disgrace. As pointed out by W. E. Fohl, who has been president of an association just as unfortunate, the publication of minutes is not absolutely vital to the life of an institute. The principal duty is for the members to meet together and to discuss mining problems, and this they can do without rushing into print.

Josiah Keeley, a vice-president of the West Virginia institute, who occupied the chair on the first day, declared that it might be well if the institute ceased to exist for awhile so that it might experience the joys of a resurrection at the hands of someone with galvanic force enough to enable it to get up and walk.

With the president, J. C. McKinley of Wheeling, absent and the three ex-presidents, J. B. Hanford of Morgantown, Frank Haas of Fairmont and Neil Robinson of Charleston, also away, the meeting did show some signs of forlorn abandonment. Yet there were perhaps 60 present, and nearly everyone so recorded actually attended the meetings from session to session. The interest was sustained, so why worry so much about the gate receipts?

E. N. Zern made his annual report, which was just as interesting and bright as usual. His extempore address was as good as any made on the floor. But he seemed to have given up hope this year, because he could not induce the operators of the various companies to promise to take five copies of the proceedings apiece at $2 each copy. He received 26 assents from 126 letters, 11 of which assents were accompanied by money.

## Operators' Associations vs. Mine Institutes

The companies support operators' associations of various kinds. Every corporate activity of that sort is active and aggressive and it does seem that the mine owners should be as interested in how to operate their mines as in how to manage their business. The operators' associations pay fairly large salaries to highly competent men and keep an adequate stenographic force. Apparently some of them maintain press bureaus. They hold frequent meetings and manage to obtain a large attendance. But when an institute to make the management efficient is proposed, it is found that there are too many institutions to support and $10 a year is too large a burden for the concern to expend in such an enterprise.

The conditions of the institutes, with their paltry needs of, say, $1,500 to $2,000 a year, in commonwealths among the richest in the world, is an example of the little all that can be and is being achieved with "universal voluntary" support, as President Wilson would term it with unconscious irony.

The first session of the institute was held on Thursday, June 1, with addresses of welcome from Fred W. Udy, president of the Bluefield Chamber of Commerce, and Col. W. H. Thomas, vice-president of the Pocahontas Operators' Association. The president of the institute was to have followed with an address entitled "The Coal Industry and National Preparedness," but he telegraphed that he could not be present. Ernest L. Bailey, of Crumpler, W. Va., read a paper entitled "Cost Analysis Engineering Applied to Mining Operations," which was well received.

The second session was grossly commercial. Every number was presented by people with something to sell, and yet the interest was perhaps greater in this part of the program than in any other part, for the papers were all good and free from a mere adulation of the products described. Too many of the sales agents who introduce their materials to the public disgust everyone with their self-consciousness.

But the paper by Charles L. Bowman, on "The Use of Doors in Mine Ventilation," that on "Essential Construction Features of Mine Buildings," by R. H. Hamill, Huntington, W. Va.; that on "Cement Roofing for Mine Buildings," by R. W. Meyer, Wheeling, W. Va., and that on "The Asbestos Shingle," by J. W. Latimer, Pittsburgh, Penn., were all clear of objectionable features and really instructive. E. N. Zern was fortunate in obtaining papers of that character. The experience of the Coal Mining Institute of America in permitting the reading of commercial papers, while sometimes quite fortunate, has more often been bitterly disappointing.

## Lure of the Land May Be Even Too Strong

The evening paper on "The Miner's Garden," by R. D. Patterson, of Lowe, W. Va., advocating more miners' gardens, furnished no surprises. Gardening has strong devotees among the miners of West Virginia, and one operator bemoaned the fact that the lure of the soil was so strong that he had been obliged to plant large areas to oats to prevent his miners from devoting all their working time to the raising of vegetables.

The rest of the evening was occupied with two addresses and discussions on "Central Station Service for Coal Mines." The producer's standpoint was argued by J. B. Crane, of Bluefield, and the consumer's point of view by G. M. Wolfe, of Davy. This time-honored but still fiercely debated discussion was well presented by both parties. The matter did not drag as much as it had when introduced at Pittsburgh, and there seemed more who were competent to discuss it.

The question of the length of time taken to estimate the peak load received the usual discussion. It appeared that at Bluefield the period taken is 5 min.

P. T. Colgan, of the Spruce Valley Coal Co., Blair, W. Va., advocated avoiding all uncertainties by buying by direct-current measurement. He stated that 15 to 50 per cent. of the alternating-current power was spent in conversion to direct current, and he warned the

operators that they must allow for that loss and not overlook it as many were prone to do. He said he had coal 7 ft. thick, that 5½ to 6 ft. was extracted and the rest left for roof. The drainage conditions were good, and the grade in favor of the loads was 0.03 per cent. He mined all coal by machine and hauled all his coal with a storage-battery locomotive, and his price for power was 2c. per ton of coal produced. He added that he mined 10,000 tons per month.

### Direct-Current Measurement the Desideratum

He declared that he had been told that he should nail up his contract with 20-penny nails for some agent would be sure to try to get him to change it for an alluring but unsatisfactory contract on an alternating-current basis. He had been expecting the proposition, but so far no one had ventured to approach him. He attributed his success in reducing his power costs below those of his rivals in Kentucky to his direct-current contract. J. B. Crane said that he knew the terms of Mr. Patterson's agreement, and if the operators of Bluefield would accept Mr. Patterson's direct-current contract for the alternating-current contracts they now held from his company, the public-service corporation he served would very readily make the exchange—a statement which the advocate of direct-current measurement ignored.

E. Drennan, of Big Stone Gap, urged that it was quite natural for a power-manufacturing company to sell what it produced—that is, alternating power. The loss on conversion to direct current would vary from 7 to 18 per cent.. and of course if the power company sold direct current, they would want a better price for it. He preferred to buy on an alternating-current basis.

Another speaker said that the companies could hardly figure on a direct-current basis for all the power they delivered, because while all the power was fed into the lines as alternating current, some companies used from 15 to 20 per cent. of the current without conversion. He did not believe it well to change the basis because the mines might soon be wholly on an alternating-current basis. The alternating-current two-speed fan was making progress, machines using alternating current were already common, and haulage by that means was being carefully studied. He hoped that in a short while there would be but little direct current used in the mines.

Congressman Howard Sutherland was then introduced to the audience, and he told them how he had manifested coal and made up payrolls and how he thought that he was qualified as one of the mining fraternity. His term would not last much longer, and he hoped to be a senator later, but so long as he occupied the office of representative, he would be delighted to serve his constituency if they would but command him. Thus time is wasted.

### Paying Separately for Every Item of Labor

The fourth session, which opened at 9:30 a.m., was addressed by P. A. Grady. His paper was "Some Duties of a Company Mine Inspector." The discussion wandered a little far afield. W. E. Fohl urged that the miner would never feel an interest in setting props and timber till he was paid for that service. R. D. Hall urged that the practice was unfortunate as even English mine managers, who had it, would willingly admit. It is not in line with the best American practice. The custom of charging for every service rendered, such as setting props, placing timbers, taking down loose slate and a hundred kindred matters, was like that of charging for service, lights and fire at an English hotel. It involved an immense amount of bookkeeping without commensurate result and multiplied the many opportunities for friction.

Mr. Grady having urged that the promotion of safety was one of the leading duties of a company mine inspector, Mr. Hall declared that where the union was established it had quite frequently concerned itself with safety and in certain cases had been induced to coöperate with the companies in securing such discipline as assured safety in the mines. Whatever might be said as to the union, the fact remained that it comprised half the men engaged in coal mining and it must contain some men from whom a large measure of respect for safety, regard for order and sense of social responsibility might be expected.

The Italians needed to have some attention accorded them. It would be well if some of the larger companies would take some Italian—perhaps a college undergraduate—give him a little inkling of the needs of mining and let him circulate through the mines, giving instruction in a language more definite than could be conveyed by the "pidgin" English which the average foreman thinks is that most readily understood by the Italian workman.

E. N. Zern and Dean Jones of the University of West Virginia at Morgantown gave a description of the extension work in the various mining villages being done by three representatives of the university. It is customary at these meetings to have an Italian miner, who is better instructed in English than his fellows, repeat what the English instructor has just said. Of course such instruction does not extend into the mines where it might be made most effective.

### Mine Inspection With and Without Authority

One manager doubted the value of mine inspection without accompanying authority to order or discharge and said he preferred to use the reports of his engineers and to follow up the private information thus obtained by a personal inspection made apparently on his own suggestion. Mr. Grady believed the inspector should not be clothed with authority, but should be the "eyes of the manager" and enable him to know and see what would otherwise escape him. W. H. Grady took the same position with regard to the company inspector's authority, but he added that in his belief the inspector should use his opportunity to take counsel with the miner, foreman and superintendent and lead them and himself to a correct view of the problems presented.

E. Drennan, general manager of the Stonega Coal and Coke Co., then read a paper entitled "Tendencies," urging that a new view was being taken of the relation between employer and employee. The paper well described the humanitarian and conservationist viewpoints which have replaced the old idea that coal at a low rate was the sole desideratum of the mining man.

Charles W. Connor then read an article on "The Mine Labor Situation." The scarcity of labor was least felt, the speaker stated, where the living conditions were most favorable. The new camps had enough men, while the others were short of labor. He thought that the

new liquor laws had reduced the number of men in West Virginia but little, especially in the central parts.

Of course the immigrants had many of them returned home to fight, causing a shortage in available labor, and the lure of the munition shops had not been without its effect. To meet the losses, however caused, Mr. Patterson advocated uptodate towns and comforts.

One manager was disposed to doubt if new towns were so attractive, as he had 60 or 70 applicants for work a week and his towns were old and not really model. He thought a new town was attractive to the miner, whether model or otherwise, for miners always like to work under new conditions, but he doubted whether a camp with modern provisions for welfare was really as attractive as Mr. Patterson painted it.

However, the village held up as an example of the unregenerate mine camp is really not so free from desirable qualities as the manager pretended. It is a leader in educational work; no open meeting is held without the presence of the manager or his wife, and the feeling of home exists even if the town is not a show place. Perhaps the manager was only leading up to the idea that mere physical perfection would never make a village into a home. If that was his idea, his modesty forbade him to declare it.

### Business Meeting Decides on Huntington

The business session which followed ended in a decision to make a further appeal to the operators for support. The institute authorized the secretary to suspend publication of the minutes if the money for that purpose did not appear to be obtainable by Aug. 1 and authorized him to return the money received from the coal companies if the proceedings could not be issued.

Huntington found in W. H. Cunningham a strong and capable advocate, and after some debate he landed the next convention for that city. So it appears that the Kentucky Mining Institute will not be able to meet the West Virginia Coal Mining Institute at Cincinnati, Ohio, as was planned originally. The West Virginians with obvious reluctance changed their minds in favor of Huntington, realizing that it meant an accession to their membership in that part of the field. They invite Kentucky to meet with them and hope that the executive committee of that institute, which has power to make the change, will realize that the needs of the West Virginia Institute in this matter are imperative while the election to meet in Cincinnati made by the Kentuckians was a choice based on a mere preference and not on an organic need.

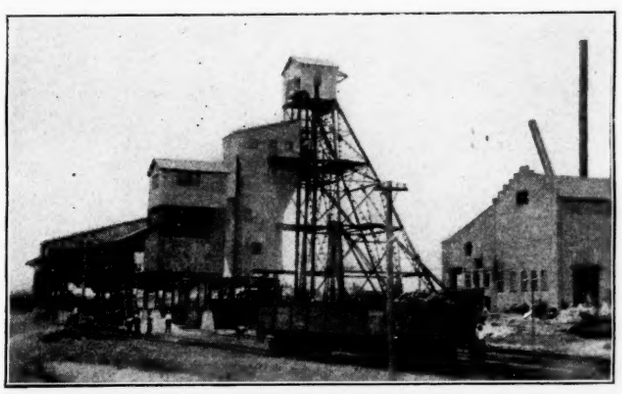
In the afternoon the Bluefield Chamber of Commerce, the Pocahontas Operators' Association and the Norfolk & Western Railway Co. provided a special train for a visit to the Bluestone Power House, where the railroad has an important electrical installation to move its mammoth trains of cars, some of which have 12 wheels and hold 100 tons of coal apiece. The plant has 10 Stirling boilers, each of 677 b.hp., with Westinghouse stokers. In the power house are 3 alternating-current turbo-generators generating a maximum of 11,250 kv.-a. at 11,000 volts 25-cycle single-phase current. These units are the product of the Westinghouse Electric and Manufacturing Co.

On their return the delegates were taken in automobiles the length and breadth of the beautiful town of Bluefield, which is perched on the sides and summits of a cluster of pretty little hills. It is a delightful town. The use of electricity for the locomotives promises to take away what little smoke it has, which after all is not much for a railroad center. The fact that no coal is found on the site of the town frees it from the untidiness inseparable from that or any other industrial development. The people are proud of their town and with good reason.

## Illinois Mining Institute

The summer meeting of the Illinois Mining Institute was held at Du Quoin on May 25 to 27. Du Quoin is in the midst of the southern part of the Illinois coal fields, a portion which has come into great prominence recently, and a considerable part of the attendance at the meeting is doubtless to be attributed to the desire of some members from other districts to see something of the operations here.

The inspection of mines was the most important and most enjoyed feature of the meeting. On Friday morning about twenty automobile loads left Du Quoin, and



MINE NO. 2, CHRISTOPHER COAL CO.

the first stop was made at the mine of the Paradise Coal Co. Attention was given only to the surface plant at this mine.

The second stop was at mine No. 2 of the Christopher Coal Co., formerly operated by the Ziegler District Colliery Co. This plant received much attention and was highly commended by the visitors. It is operated entirely by electricity. The hoist is driven by a slow-speed d.-c. motor mounted directly on the drum shaft. Alternating current is generated at 2,300 v. and transformed, for use in the hoist motor, by a flywheel motor-generator set. The hoist is controlled by changing the field of the d.-c. generator. A feature that is unusual in the mines in this part of the country is the equipment of the escape shaft with a hoist; the hoist is also unusual in that it operates a single cage, which is counterbalanced. It is used for handling men and supplies. One compartment of the shaft is of course provided with stairs.

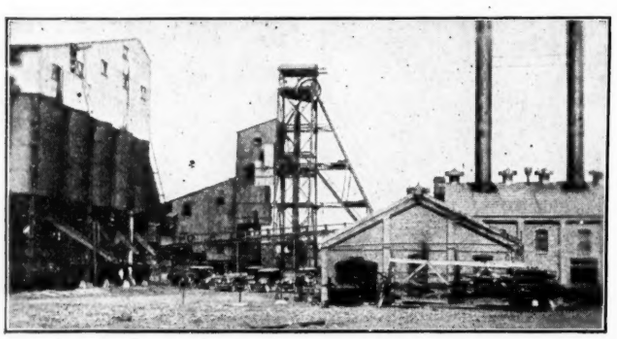
Another thing which is unusual now, but which will, it is to be hoped, become common in the future, is the generation of power at the mine for commercial purposes. The Egyptian Electric Co., housed in the same power house used by the coal company, supplies current at 33,000 v. for transmission to various points of consumption. Surely it cannot be long until the wasteful transportation of coal for the generation of power will be greatly decreased. Coal must be transported to the place

of consumption for heating purposes because it is cheaper to use the heat produced directly from the coal, but if it is to be used for power, it will eventually be transported largely in the form of electricity. Here in "Egypt" is one of the early plants of the kind.

From this mine the party went to the No. 1 mine of the United Coal and Mining Co., where a luncheon was served by the company at its administration building. About 150 guests were entertained. In the afternoon the members of the institute went first to the No. 2 mine of the same company, commonly known as the Buckner. The second stop was at the Majestic mine of the Majestic Coal and Coke Co. and the last at the Security mine of Security Coal and Mining Co.

On Friday evening the members of the institute were entertained at a banquet by the operators and business men of the district.

As far as technical papers were concerned, the success of the meeting was not complete, as various things prevented the appearance of some of the speakers. David Ross gave an interesting and valuable paper on the "History of Coal Mining in Illinois," and a good paper by Alex. C. Nicht, Jr., read by the secretary, dealt with



BUCKNER MINE OF THE UNITED COAL AND MINING CO.

"The Use of Electricity in Mine Hoisting." The latter paper was devoted especially to the hoisting plant of the Kincaid Coal Co., which was designed to hoist 9,000 lb. per trip, making a trip every 25 sec., with a rope speed of 1,000 ft. per min. When operated at this rate—that is, 144 trips per hr.—the current consumption is 0.589 kw. per ton.

J. P. Reese, general superintendent of the Superior Coal Co., opened an interesting discussion of efficiency and gave some account of the efforts of his company toward the attainment of efficiency of operation and the prevention of accidents.

Steps were taken to insure for future meetings a larger number of technical papers and to provide for their discussion. The growth of the institute is encouraging, and the prospects for the future are good. Illinois, now the third state in the country in the production of coal, is assured of increasing prominence in the future, and its mining institute will be sure to increase its usefulness to the industry.

**The Occurrence of Coal and Oil in Turkey** has been reported from a large number of localities. In only one instance has mining been carried on in any manner compatible with the demands of modern consumption. Aside from this, work has been confined to desultory attempts that were scarcely adequate to meet even the limited local requirements. In no case can technical data regarding the extent, depth or persistence of seams be had.

## Extracts from a Superintendent's Diary

A steeplejack blew into camp today and within a few minutes after his arrival had contracted to paint the large steel stack at our central power house and began to stretch his tackle. As far back as I can remember, a steeplejack has always appeared upon the scene within a short time after we decided that we had a stack to paint, and strange as it may seem, I have no recollection of one ever having appeared at any other time. Since the same steeplejack has never paid us a second visit, these visits at opportune times cannot be the result of estimates as to the life of a previous painting, but must be credited to pure luck or fate or "hunches," whatever they may be.

These daredevils always draw a crowd of admiring lookers-on, who begin to collect at the first sign of activity and often become impatient before the block and tackle is adjusted.

Several times today I took occasion to wander out and mix with the group of spellbound spectators surrounding the power-house stack just to hear what they had to say. After all, the fellow was in no danger so long as he kept his wits about him, but the result of a single misstep was so easy to contemplate that most of the spectators could think of nothing else, and most of the conversation hinged on that one subject. Over and over and over again one could hear the remark, "Suppose he should lose his balance," and the suggestion was always followed by much shaking of heads.

Sandy Paxton, standing on the edge of the group, remarked in an unfortunate moment that there ought to be a law prohibiting any man from thus taking his life in his hands. Last week Sandy not only took his own life in his hands, but in so doing risked the lives of all the men working on his entry as well. John Scott, one of the men who had been on that entry and because of that fact was now a temporary cripple, overheard Sandy's remark and waxed warm in consequence; he had been itching for an opportunity to talk it out with Sandy all week. During the tongue-lashing that followed, the steeplejack was all but forgotten so exciting became the irruptions.

Sandy faced the onslaught for some minutes, but realizing at last that he was not a match for John and realizing further that the sympathies of the audience were very much with the latter, decided that he would retire from the field. In attempting to do that he became entangled, in some unaccountable manner, with the rope used by the stack painter for raising and lowering his paint bucket, and before he comprehended that anything unusual was happening, managed to turn a bucket of asphaltum that was dangling in mid-air upside down and received the entire contents of the bucket on his head and shoulders.

What an unhappy ending, in so far as it concerned Sandy, for a day's adventure that had in contemplation nothing more startling than the witnessing of a feat in stack painting! The stack painter received no more admiring glances from his audience that day—John Scott had impressed them too deeply with the tragic side of taking chances; then too he had lost his temper because of the loss of his paint and continually scowled at the star-gazers below.

## Bering River Field Isolated

On the ground that, in Alaska, the government has practically prohibited the construction of railroads by private individuals and that it is unjust for the government to build up one community at the expense of another, the Cordova Chamber of Commerce, in an elaborate brief, has asked President Wilson to order the construction of 50 mi. of government railroad to make the Bering River coal and oil fields available. The chambers of commerce of the Pacific Coast are now being solicited to endorse the movement.

The petition points out that the Bering River field, the coal in which is said to be just as good as in any other field, is nearest to the markets of the Pacific Coast, and that this coal, as well as the oil from the same district, can be made available by the construction of 50 mi. of road. It is urged that the coal of this field is absolutely essential for the proper development of the copper-mining region.

The government has gone to great expense in making provision for the leasing of coal lands in the Bering River field, but it has made no provision for hauling the coal. The distance from the Bering River coal region to Cordova is 68 mi., while the Matanuska field, to which the government is building its road, is 185 mi. from Seward, and the Nenana field is distant 104 mi. from Fairbanks.

The cost for the first road is estimated at $1,000,000, the Matanuska line is expected to cost $7,000,000 and the Nenana-Fairbanks road $3,000,000. These estimates are based on the supposition that the government will not deliberately parallel the tracks of an already existing road—the Copper River & Northwestern—for a distance of 29 mi., but would enter into a traffic arrangement with it under the common-user provision of the interstate commerce laws. The connection could be built in from three to six months, while three years will be consumed in building either of the roads on which the government is now working. Bering river coal, according to government engineers, can be landed at Cordova for $1.42 a ton, while Matanuska coal will cost $3.38.

The President's attention is directed to the fact that it is unjust to develop one locality and refuse to develop another equally entitled to it. Such discrimination, it says, is prohibited by the Interstate Commerce Commission, and violation of the law is punishable by fine and imprisonment. When the government itself goes into the railroad business, it is contended, it should be guided by the spirit of the law which it applies to individuals, even though it is not amenable to such legislation.

"It is criminal for a private corporation to strangle and kill one locality while it builds up another," says the petition. Should not the government itself refrain from doing the same thing?"

One of the arguments for the construction of this line is the statement that there are more than 500 copper mines which might be worked at a profit, if the Bering River coal were available and a smelter could be constructed in Alaska. The people of Alaska, denied the use of this coal, are not only obliged to see these great resources remain undeveloped, but have to pay high prices for coal brought from foreign countries. Many communities see their best efforts for progress defeated by the obstruction and discrimination of their own government.

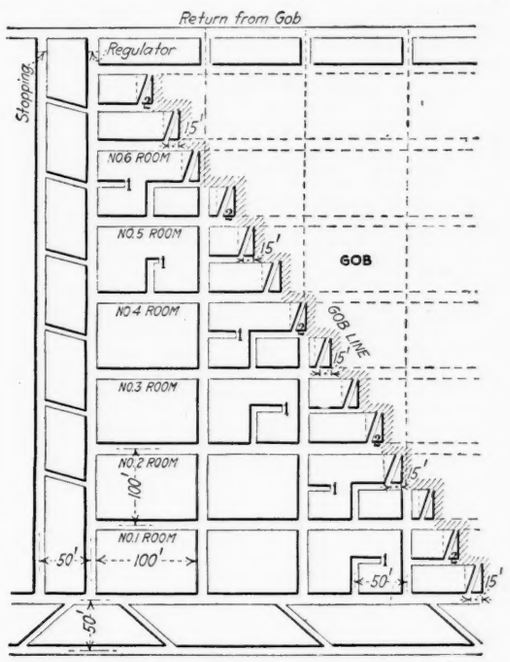
"The truth is," says the petition, "the Bering River coal has long been the subject of political controversy. The most astonishing lies have been invented about it and retailed to the public for political purposes."

## Drawing Room Pillars Under Heavy Cover

By George Stockdale*

The accompanying sketch shows a pillar section being drawn under a heavy cover. It will be noticed that the rooms have been turned on 100-ft. centers. The rooms are 10 ft. wide, leaving a 90-ft. pillar with cut-throughs every 100 ft. These pillars are divided again by driving a place halfway through the pillar 50 ft. back from the gob; a place is also driven off the last cut-through, as shown in the sketch. These places are driven 10 ft. wide, leaving a 40-ft. pillar on each side.

The pillars are then drawn back by driving a place through the pillar every 15 ft. These are driven through to the gob, leaving a three-cornered stump next to the gob 15 ft. thick at the roadway. When drawing back




GENERAL SCHEME OF PILLAR WITHDRAWAL

the stump, a slab is taken off the left side, bringing it back on a square face for the next cut.

The gob line is kept uniform by keeping the pillars 15 ft., one in advance of the other, as shown in the accompanying illustration. The pillars are drawn back by four men—two in each place—and one in the solid, making five men in each room. The number of men in each place is indicated on the sketch.

There are 34 men working on the seven pillars shown, which force under ordinary conditions will average six 40-bushel wagons, totaling $34 \times 6 = 204$ wagons from this section.

I believe that if this method was adopted, it would result in the recovery of a larger percentage of the pillar coal with greater safety to the workmen.

*Mt. Braddock, Penn.

# The Labor Situation

## General Labor Review

The anthracite region is gradually quieting down. The miners realize that there is no advantage in opposing their own agreements. It is true there was no referendum, but the contract was submitted to a convention in which the men were quite numerously represented, and they cannot declare they are not bound by its provisions.

They do, however, quite generally feel that the disadvantages of the document should have been more adequately represented to them, and at Wilkes-Barre they have held a meeting and attacked the action of their officers, expressing the idea that a new staff should be elected.

The miners are trying at a colliery of the Lehigh & Wilkes-Barre Coal Co. to use the law, Article 12, Rules 17 and 57 of the Act of 1891, to compel the operators to supply them with cars at all hours so that they may at their pleasure return to the surface. The first of those rules says among other things:

Whenever five persons shall arrive at the bottom of any shaft or slope in which persons are regularly hoisted or lowered, they shall be furnished with an empty car or cage and be hoisted, except, however, in mines where there is provided a traveling way having an average pitch of 15 deg. or less and not more than 1,000 ft. in length.

The miners of the Delaware, Lackawana & Western Railroad Co., coal department, are protesting against the contractor miner who hires his own help and makes what profit or accepts what loss may result. If he pays, as is stated, union wages, why should the union object? There is no basis for an objection to be found in the scale signed, and John T. Dempsey as a member of the conciliation board should not be urging that the contractor miner is a violation of the agreement.

### Pittsburgh Miners Want McAlpin Agreement

In the Pittsburgh region the miners allege that the recent district agreement is in violation of the McAlpin contract because of the changes in the rates for house rent, household coal, electric lamps, permissibles and caps. But they declare that even if this were not so the district agreement is invalid for it has only had the signatures of the scale committee, whereas a referendum was required to make it effective.

They claim that the operators knew that the scale committee was not empowered to act. They allege that President Van Bittner of that district so informed President W. K. Fields of the Pittsburgh Coal Operators' Association and of the Pittsburgh Coal Co. at a conference when International President J. P. White, Vice-President W. P. Hanaway of district No. 5, and International Statistician William Diamond were all present.

On June 4 the convention being held at the Union Labor Temple was adjourned and some of the men returned to work. The threatened ousting of the district officers did not occur. The meeting for that purpose was called for June 12, and only 22 unions voted for it. It was clearly impossible to throw out the officers in an entirely different meeting held before that date.

The operators have met the men and will meet them again, and an agreement will doubtless be obtained. The miners seem willing to keep within the requirements of the McAlpin agreement. Surely they cannot desire any better contract than the McAlpin, for that document was quite discriminatory as against the operators of the Pittsburgh region. The operators declare that the miners will receive an increase at least $\frac{1}{2}$c. per ton higher than any other district even if all the clauses of the district contract remain in force.

### Regulations Which the Miners Do Not Like

The miners object to rule 3, which provides a $1 fine for every day the miners are idle on a strike, and rule 10, which prescribes snubbing. They also protest against rule 22, which states:

It is agreed that house rents may be advanced 5 per cent. over existing rates with the understanding that houses built during scale period ending Mar. 31, 1916, will not be advanced. It is agreed that the price of coal to employees may, at the option of the operator be advanced 10 per cent. on prices charged during scale period ending Mar. 31, 1916.

Another unpopular clause in the "general contract" prescribes 5c. as the shift charge for electric cap lamps:

Electric cap lamps shall be substituted for locked safety lamps at a charge to the user of 5c. per shift per lamp. A safety lamp, where required by the cutter to comply with the mining law, will be furnished him free. The miner shall be responsible for taking care of his electric cap lamp, and no extra charge shall be made unless he deliberately or carelessly breaks any part of same.

Where electric cap lamp is substituted voluntarily on the part of the operator for an open lamp, a charge of 5c. per shift per lamp shall be made.

Another clause which is equally unpopular says that:

Permissible explosives and detonators shall be furnished by the operator to the miner at 5 per cent. above cost price.

In Ohio there is nothing disturbing except a determination of the Hocking Valley miners to get a new scale for coal thinner than 5 ft. To this they are certainly not entitled under the McAlpin agreement.

In the southwest the meeting of operators and miners was adjourned from May 15 until June 2. The operators of district No. 14 refused point blank to even consider a contract until the miners who were on strike in contravention of the old settlement went back to work. They do not want to make an agreement with flagrant contract-breakers.

In the organized coal fields of western Kentucky 13 mines are now running at full capacity employing 1,000 men out of the 5,200 working in district No. 23. The Western Kentucky Coal Operators' Association recently locked out the men, but President Robert Pollock of the district reports the following mines working: Central City, Advance and Wooden in Muhlenberg County, and the DeKoven, Uniontown, Waverly and Baskett mines, also two mines at Morganfield, two at Henderson and two more at Island Station. Several other operators are discussing contracts with the mine workers.

## Anthracite Miners Discontent

Little of the peace anticipated has been realized in the anthracite region. The mine workers as a whole are still not satisfied with the 8-hr. day provisions, though of course those who work at a point that can easily be reached find their time much shortened. Thus a breaker hand or a cager saves a full hour of labor. On the other hand, the contract miner and laborer, who never did work for 8 hr., find their time increased instead of diminished.

The cry that the hours were too long was largely a plea to sentiment rather than an appeal to facts. Many of the men never took any time for dinner. This was not because they did not eat, for their buckets were fairly overflowing with the best and most nourishing of food. The daymen always managed to stow away plenty of provender, but they did it between cars when there was a lull in the mining work and often, too, when there was no lull. Their declaration was "Now I'm going to sit down and take a piece," and that was the end of it.

Ever since the contract was signed, the men have had to take a half-hour for lunch, and if they start a quarter of an hour later, they get home only a quarter of an hour earlier and the working day seems almost as long as ever. The men around the mines have always worked in a happy-go-lucky way, and under the new 8-hr. day rule the companies have decided to see that the men give a full 8 hr. work for 8 hr. pay.

### Strikes Occur All Over Anthracite Region

As a result there is trouble everywhere. As stated on May 26, the Lehigh Coal and Navigation Co.'s collieries Nos. 10 and 11 were tied up because the contract miners wanted to come up to the surface early. The foremen were willing to allow those men whose places were warm or damp to come out before the whistle blew, but they held that the other men might as well wait till quitting time and not delay operations. Besides, if they stayed in the mine, they might think better of the advantage open to them to load more coal. The other mines decided not to follow the lead of Nos. 10 and 11 and did not strike.

On May 25 the men of the William A. colliery of the Lehigh Valley Coal Co. quit work. Shortly afterward several breaker men at the Johnson colliery of the Green Ridge Coal Co. struck, in this case against the rate of wages. On May 31 750 men and boys quit work at the Draper colliery

at Gilbertson because the Philadelphia & Reading Coal and Iron Co. failed to grant certain concessions to the drivers.

Other important strikes are occurring at the National and Dodge collieries of the Delaware, Lackawanna & Western R.R. Coal Department. Here the opposition is to the contractor mining system, which the miners would like to declare a violation of the new working agreement. The contractors are allowed to mine certain veins, and they hire miners and laborers to that end.

**Miner's Dinner Is Not a "Movable Feast"**

On June 2 the William A. miners had decided to go back to work. They had thought when they quit that dinner had been made a "movable feast," arranged to suit the convenience of the company and planned so that it would come whenever coal was not needed at the breaker. But finding the time was set regularly at 11:30 a.m., they concluded they could train their stomachs to be satisfied with that time and went back to work.

On June 3 a thousand miners at the Harwood colliery of the Lehigh Coal and Navigation Co. struck. Some of the men were unwilling to pay dues to the union out of the "bonus" money they received from the company. This bonus payment represented the difference between the new and old scales. As the new contract was made retroactive so as to date from Apr. 1, the companies had to pay the men a large bonus on the work done meantime. The union wanted a part of this, and the men struck to compel all the men to pay that part.

On June 5 the colliery of the Delaware & Hudson Co. at Laflin went on strike. It is thought that the Industrial Workers of the World is the cause of the trouble, but the ostensible reason for the strike is the application of the 8-hr. day.

The Washington colliery of the Lehigh & Wilkes-Barre Coal Co. went on strike at the same time as the Nottingham as a protest against the decision made by the company that contract miners should work the full 8 hr. On June 5 Lance No. 11 of the same company struck, alleging that the mules were not harnessed, cleaned and cared for by the company's barn force as they believed was required if the decision of the conciliation board was to be completely adhered to. The Buttonwood mine of the same company struck on June 7, also in protest against the rule requiring contract miners and others to work 8 hr.

**"Industrial Workers" Try Work for a While**

Nevertheless, despite the discontent, there is a closer approach to order apparent in the anthracite region than there was a few weeks ago, when the contract was new. The Industrial Workers of the World are now quiet at Old Forge, and the adherents of that desperate body have decided that peace and law observance is alone safe. The sheriff, 50 deputies and 25 mounted state troopers have been furnishing the protection under which union men could work at Old Forge, and some I. W. W.'s were found marching with their dinner pails to work when the mine started on May 29.

Three of the I. W. W. agitators were arrested on May 25. Each was found to have a 38-caliber revolver and a large stiletto. The arrests and show of force by the authorities have impressed the I. W. W., and the union now hopes that it will be able to convert these men from the parlous joys of collective violence to the happier practice of collective bargaining.

**Would Oust Their Present Union Officials**

Discontent among the miners regarding the new agreement resulted on June 3 in a meeting of representatives of 16 collieries in the Wilkes-Barre district. These delegates declared their dissatisfaction with the contract and then passed a resolution repudiating the district officers for "misrepresenting the agreement to the delegates at the Pottsville convention."

John Dempsey, president of district No. 1, declares that the names signed to the resolution are those of men who have been playing politics within the organization for the last several years, that they are office seekers who are using the attacks upon the officers to further their own ends. The men allege that they are preparing to "clean house" and that a new force of officers is needed in the anthracite region. The meeting was held in the auditorium of the Y. M. C. A. at Wilkes-Barre; the chairman of the meeting was S. F. Reynolds, of Plymouth, and Daniel Thomas, secretary. The resolution follows:

Be it resolved by the representatives of 16 local unions of District No. 1, U. M. W. of A., present at a meeting held in the Y. M. C. A. building, that we hereby repudiate our district officers because they misrepresented the agreement to the delegates at the Pottsville Convention and for other actions obnoxious to the undersigned: Jacob Urban, Richard Edwards, William Moore, John J. Lynch, William Bradley, Michael Trogin, Daniel Thomas, S. F. Reynolds, Thomas Morgan Joseph Porter, George Isaacs, Edwin Beech, William Mates, Eugene Bradley, John A. Long, David C. Price, John Urban, John J. Neuson, Thomas Holton, Thomas G. Evans, Morris Williams, George W. Reed, Walter Patton, William Jeffrey, William Woods, John Kowalchin and T. A. Kowalski.

**Delaware & Hudson Raises Foremen's Wages**

The Delaware & Hudson Co. increased the wages of its foremen and assistant foremen, June 1, approximately 20 per cent. according to some of the men affected. E. R. Pettebone, one of the general superintendents, declared that no announcement would be made for a day or two. Driver bosses received increases from $80 to $95 a month, firebosses from $90 to $105, assistant foremen from $95 to $115, and inside foremen from $125 to $150 a month. Outside and assistant foremen were also given increases of a similar amount.

The bosses at the Delaware & Hudson works have been discontented for some time. When in 1912 the miners received a 10-per cent. increase, the foremen got a little less than 5 per cent. They expected at least 7 per cent. under the present contract and were expecting back pay for the period since 1912, at which time as stated they believed discrimination had been shown against them. They are delighted with the increase granted, and it is said they are willing to drop all their claims for the alleged shortage in their pay during the last four years.

## Strike in Pittsburgh Region

The Pittsburgh region is still on strike in the sense in which persons generally understand that word. The union denies that there is a strike. The men have suspended work, it is true, but the union has not authorized the suspension, therefore there is no strike. Nevertheless the condition is not one under which much coal can be obtained.

The meetings to discuss the strike have been extremely disorderly. On Saturday, Apr. 27, some policemen put in an appearance. The delegates immediately demanded who had sent them, but no one could be found to admit having requested their attendance, and after a while they withdrew.

**Convention Hears Van Bittner's Argument**

On this day the questions as to who was entitled to sit in the convention were finally settled. The California, Penn., local was the cause of much trouble, six delegates being declared illegally elected. On the following day the district agreement was read by Frank P. Hanaway, vice-president of the wage-scale committee, and Van Bittner, the district president, made an address declaring that the western Pennsylvania contract was more favorable to the miners than that just concluded in eastern Ohio. Frank J. Hayes, international vice-president, occupied the chair. Two delegates discussed the agreement in no gentle terms.

On the next meeting day, which was Monday, May 29, the delegates recommenced their denunciation of the agresment. Van Bittner, who was sitting in the convention as a delegate from Cherry Valley, was met by jeers and hoots whenever he tried to address the convention. One delegate declared that the miners had been "sold at auction with our representatives as auctioneers." Delegate Luke Anderson stated that an official of one of the coal companies had said that the contract was "the rottenest scale ever."

**Scale Is Repudiated and Another Ordered**

In the afternoon of May 30 the delegates rejected the new wage scale and ordered that a committee of eight be selected from the floor of the convention to obtain another. This new wage-scale committee was to confer with the operators and to endeavor to make a new scale more favorable to the miners. The disorder at this meeting was so disturbing that Vice-President Frank J. Hayes declared several recesses to restore quiet. The motion to remove the district officials was ruled out of order.

On May 31 the miners demanded of Vice-President Hayes if the mines would be shut down now that the agreement was disapproved by the miners of the district. They thought the miners should remain on strike until the new agreement could be made. Vice-President Hayes explained that the international constitution clearly declares that there shall be no strike in any district unless sanctioned by an international convention or the international board, neither of which has given its approval to the present strike.

Leroy Bruce, of Charleroi, and seven other delegates were named from the floor of the convention as a wage-scale committee, and the Charleroi man was made chairman. This committee met with representatives of the Pittsburgh coal operators in the afternoon and set a conference for the next day.

On that day between 500 and 600 miners employed in the Acme No. 1 and No. 2 mines of the Pittsburgh-Westmoreland Coal Co. went on strike, declaring that the company had raised the house rent of the company employees and had increased the prices of supplies sold by the company store.

### Miners' Electric Cap Lamp Causes Sensation

On June 2 the miners' delegates assembled to learn what luck the wage-scale committee had had in their meeting with the Pittsburgh Operators' Association. The committee declared that William K. Fields, the president of the operators' association, averred that at Mobile, Ala., in March, Van Bittner made the following declaration to the operators in the preliminary council held at that place: "Yes, if you give us the run-of-mine system, the miners will pay 5c. a day for safety lamps." This statement made Bittner assert that W. K. Fields was an "infernal liar."

Bittner declared that Fields in conversation with International Statistician William Diamond declared that he was "going to get Bittner, and when the Pittsburgh Coal Operators' Association goes after any person they usually get him." President Bittner advised the miners to "listen to all that the operators say, but believe very little of it." Michael Barry, being duly impressed with this advice, asked for a stenographer to take minutes as to the proceedings of the wage-scale committee.

### Wage-Scale Committee Gained No Concessions

The report of the scale committee showed that nothing had been accomplished. There appears to be a strong difference of opinion as to what took place prior to the agreement being signed at the McAlpin Hotel, William Green, the international secretary-treasurer, being one of those alleging that Fields' statements were faulty regarding that earlier conference. He said he was prepared to go with the committee and deny that he had said what was alleged.

The committee, on saying that the district agreement needed a referendum to make it valid, was told by the operators that they did not so understand it. The operators, according to Leroy Bruce, said that the miners had broken the contract and so had released the operators from any obligation. Consequently the latter felt themselves at liberty to make any contract with their men which they saw fit.

On June 3 the delegates in a vote decided to call on the international executive committee to issue orders for a strike. A statement was given out the night before by the operators, and it outlines their argument quite clearly. They show that they surrendered more than any other group of operators at the signing of the McAlpin agreement, which is absolutely true; they show how central Pennsylvania has secured a better contract than the Pittsburgh district, which also cannot be denied, but there is no attempt to show that the increases in the house rent, permissible explosives, electric lamps and coal are in accordance with the McAlpin agreement, and that is the main trouble.

They apparently relied for the provisions regarding preparation and discipline not on the letter of the agreement, but on a promise made by the mine workers' leaders, which the McAlpin contract only in part sustains. However, no one can assert that the rules regarding preparation and discipline, however much they may displease, are entirely out of harmony with the aforesaid contract.

### Operators Declare the New Contract Liberal

The operators clearly show that the district contract is a good one as compared with other district contracts and as compared with the old Pittsburgh contract, and only the more rabid of the unionists—and at a convention only the more rabid seem to be present—will deny that the contract raises wages more than that signed in other districts. The statement of the operators follows:

During the conference held in New York the operators of the Pittsburgh district were given to understand that no wage agreement could be reached unless the Pittsburgh district operators would concede the mine-run basis to the miners, and in addition agree to an advance of 2.39c. to bring the Pittsburgh mine-run basic price up to the same basic price as the Ohio scale rate, and in addition agree to any general advance granted the miners of Indiana, Ohio and Illinois.

The Pittsburgh operators were given to understand by the same parties who issued the ultimatum that if the Pittsburgh Coal Operators' Association would grant the mine-run basis to the miners of the Pittsburgh district No. 5 and give up the 2.39c. per ton for uniformity's sake in addition to agreeing to any general advance granted the other states, they could have any part, or all, or such part of the Ohio prices, scale rates, working conditions and agreement which existed in the Ohio No. 8, 1915, contract, which would be applicable to the Pittsburgh district. This meant a flat increase to the No. 5 Pittsburgh district miners of 2.39c. more than the miners of the other three states, Ohio, Indiana and Illinois, received, and compared with the central Pennsylvania field, taking into consideration the additional 3c. per ton mine-run granted the Pittsburgh district miners, means an advance of 2.69c. more than the miners of the central Pennsylvania field received, the advance on machine-mined coal granted them being 3c. per ton of 2,240 lb., while the miners of the Pittsburgh district No. 5 receive 5.39c. per ton of 2,000 lb.

After the scale was signed in New York, the Pittsburgh Coal Operators' representatives came home and met with the representatives of the miners to formulate the district agreement.

After the operators granted a 5 per cent. increase on the old Pittsburgh yardage and dead-work rates instead of the miners giving the operators the Ohio yardage and dead-work rates, plus 5 per cent., as promised, a district wage scale was finally formulated and signed by the representatives of both parties.

The objectionable features of the scale to the miners are the clauses covering preparation and discipline, which are specifically mentioned in the New York agreement.

The net advance to the miner, after considering the increased cost to him of permissible explosives, electric cap lamps, house rent and coal, to say nothing of the increase the miners received in granting them the old Pittsburgh yardage and dead-work rates, plus 5 per cent., amounts to at least nine-tenths of a cent per ton more than the advance granted in any other district.

As a matter of fact there are not over 30 per cent. of the miners in the district affected by the advance in prices of permissible explosives, electric lamps, rents and coal.

### Frank Farrington Defends District Contract

The delegates got an unpleasant scare from Frank Farrington, president of the United Mine Workers in Illinois. They said they didn't want to hear him. He was from Illinois, and this was not his kettle of fish. But Farrington plainly told them that the miners in other parts of the United States were watching the Pittsburgh miners and wanted to see them stand by their contracts and dreaded that they by their violence might destroy, not the operators' association, but their own union.

He alleged that the Pittsburgh Coal Co. and the Pittsburgh Terminal Railroad and Coal Co. wanted the miners to break their agreement so that a new arrangement could be made. Then he added: "I suppose that you miners will come over to Illinois and ask for money to finance such a strike as you contemplate. We are glad to help you, but we will not stand for insults such as you have showered on me this afternoon. I came here to give you advice, not to bully you."

After this a motion was made to oust the district officials. Chairman Hayes denied that the meeting was called for that purpose and refused to put the motion. One delegate declared that 52 out of 56 branches of the district had sent petitions to the union officials demanding a special convention to start ouster proceedings. This was denied.

A committee of miners and international officials was then named to go to the office of the district union in the First National Bank Building. They were ordered to ascertain the actual facts and returned with the statement that only 22 petitions were found. Cries of trickery arose when Chairman Hayes announced the number, and the delegates declared they would have a petition from all the branches presented to the district officials in the presence of witnesses and would see that a special convention with power to act would be called in a few days.

A meeting of the international officials will be called on Monday, June 12, at which an attempt will be made to settle the strike issue. Meantime the miners can go to work and their wages and charges will be based on the final settlement. Seven mines resumed on June 6, but at several other collieries the men have voted not to return to work till the settlement is effected.

## Southwest Mining Conferees Adjourn Session

The southwest mining conference was adjourned at its meeting on May 15 because the operators refused to discuss a new contract till the violations of the old agreement ceased. New contract enactments would bind only the operators who are law-abiding, and such regulations would only make their position more desperate, for in the industry as in a state it is better to have no law than one which is enforced only against those who are willing to obey it.

When the miners of districts Nos. 14, 21 and 25 of the United Mine Workers of America met the representatives of the Southwest Interstate Coal Operators' Association on June 2, it was found that all the cases pending in regard to district 21, covering Oklahoma and Kansas, had been satisfactorily adjusted. But in district No. 14 there was no such condition. The operators continued to oppose the making of any contracts with the representatives of miners who are idle in violation of the old contract. The union representatives declared they had no authority to act on the alleged violations, but were at the meeting to arrange a contract only, and so the conference was necessarily adjourned. It will convene again when called by the chairman and secretary of the conference. It is expected that nothing will be done for at least two weeks.

Gus Sparlin, of Thurber, Texas, has been elected as a member of the International Board of the United Mine Workers of America, representing district No. 21. He defeated W. T. Plyale, of Henryetta, Okla., by 771½ votes.

# Fighting an Anthracite Mine Fire

By W. B. Richards*

*SYNOPSIS—A mine fire started in a small pile of coal. In spite of prompt measures and the immediate use of a chemical engine, this fire cost $125,000 to finally subdue.*

A fire at the No. 9 colliery of the Lehigh Coal and Navigation Co. caused considerable trouble and much uneasiness before it was subdued. An expenditure of $125,000 may seem large, but this was less than it might have been if prompt action had not been taken.

The coal at this point dipped northward about 45 deg. The Mammoth bed here consists of three splits. The bottom split is about 8 ft. thick. Then comes a shale divider, at this point about 5 ft. in thickness and locally known as the 18-in. slate. Above this is 25 ft. of coal, then 15 ft. of shale, and above this the top split, which is 94 ft. in thickness.

A gangway at an elevation of 866 ft. had been driven from an old slope sunk in the Mammoth bed about 1878. This slope was partly destroyed by fire in 1887 and abandoned after this fire had been extinguished. A shaft was then sunk, which was completed in 1901. The No. 9 water-level tunnel was completed in 1857.

Above the second level gangway passages had been driven from No. 9 water-level gangway, which was at an elevation of 1,000 ft. from No. 3 tunnel, which has an elevation of 1,209 ft., and from No. 4 tunnel at an elevation of 1,190 ft. The locality had also been worked by counter-gangways. When the gangway was driven east from the shaft, it was projected at an elevation of 8 ft. above the old slope gangway. Mining had also been carried on in the Mammoth bed by rock holes from the Skidmore vein, making three different mining operations in the vicinity of the fire.

### Final Robbing Was in Progress

When the fire occurred, mining was proceeding on the final robbing, material was being mined through loose gob composed of coal and rock, and but few pillars were left. Those that were standing were crushed and broken, making it a dangerous condition for the fire to start in, as it was difficult to foresee in what direction it would spread.

The fire was discovered by the assistant foreman on the morning of Dec. 14, 1914, in what was called the east top split gangway of the Mammoth bed on the second level 3,000 ft. east of No. 9 shaft. When first discovered, it was in a pile of coal on the floor of the gangway. The timber at No. 19 chute was also burning.

The foreman, W. B. Cunning, immediately organized a force to fight the fire. The chemical engine was sent for and a bucket brigade formed and put to work at once carrying water in buckets from the ditch in a tunnel which was about 200 yd. west of the fire. Company officers, being notified, arrived promptly on the scene and took charge of the fire-fighting operations.

Extinguishing mine fires has always presented various difficulties, chiefly because of the impossibility of attacking the fire promptly after it is discovered. While pipe lines are being laid, the fire may spread rapidly. It is for the purpose of promptly meeting this situation that the chemical apparatus has been adopted for mine fires at all the collieries of the Lehigh Coal and Navigation Co., as with an engine of this kind a fire may be held in check if not immediately extinguished. Tanks containing chemicals are mounted on mine trucks. These are kept on the surface in a fireproof building and are run into the mines when needed. Fig. 1 shows one of these chemical engines, which is kept at the Coaldale colliery.

The apparatus consists of tanks of water in which pressure is generated from the action of sodium bicarbonate and sulphuric acid placed within the tanks and brought in contact with each other by the operation of a simple mechanism. Two tanks are employed. While one is being discharged on the fire, the other may be recharged with water which may be brought into the mine in barrels or in a tank mounted on a truck. If water is running in a convenient drainage ditch it can be poured directly into either of the tanks.

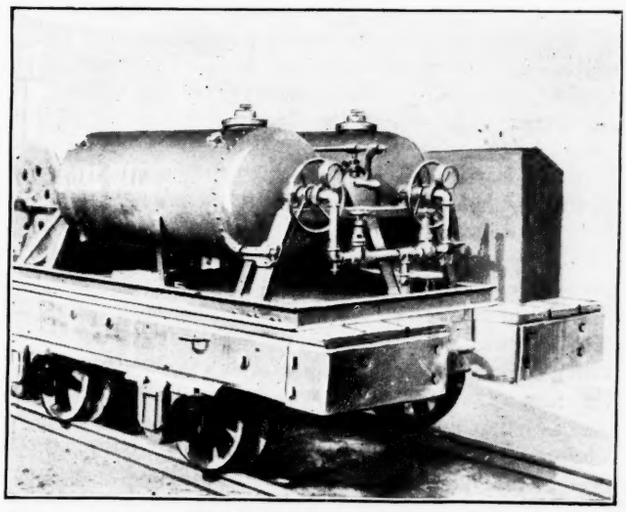


FIG. 1. THE CHEMICAL FIRE ENGINE WHICH HELD THE FIRE IN CHECK

These tanks have a capacity of 60 gal. each. In charging, 6 lb. of carbonate of soda is thoroughly mixed with water and then ½ gal. of sulphuric acid is added. When the solution is in the correct proportion and thoroughly mixed, the pressure gage will register 130 lb. per sq.in. If the proportioning and mixing are not properly done, the pressure will be considerably less. The chemical engine shown was in use three days and did effective work in preventing the fire from spreading. This engine was manufactured by the American La France Engine Co.

The telephone system was at once extended to a point near the scene of the fire, connections being made to the main office so as to keep the management properly informed of conditions underground. A Western Electric mine telephone was installed. This is inclosed in an iron box.

The fire in a short time caused a fall of coal, thus closing the gangway for about 20 ft. At a point about

*Lansford, Penn.

35 ft. outside the fire, a dam was constructed of plank and clay. Plank was laid across the gangway and nailed to the mine timber to a height of about 4 ft., and at the next set of timbers, 5 ft. farther out, another row of plank was nailed and the space between packed with clay.

While this dam was being constructed miners were driving a small hole along the top of the fall of coal

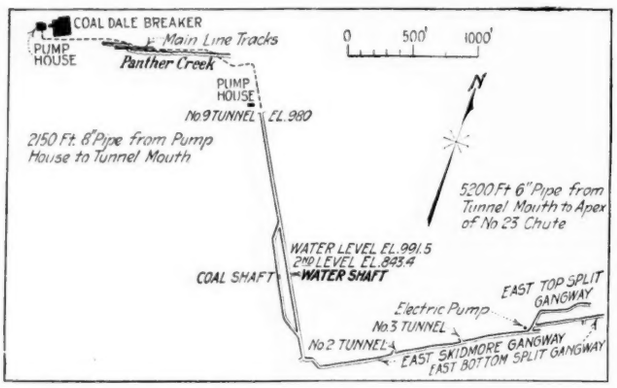



FIG. 2. LOCATION OF EAST TOP SPLIT GANGWAY IN RELATION TO SHAFT AND BREAKER

to try to shut off the fire and prevent it from going up the chute. While these men were driving through the fall under which there was fire, a nozzle made from a piece of 2½-in. pipe 7 ft. long, with the end pointed and perforated with ¼-in. holes, was driven into the fall of coal at various places to keep the fire in check.

A pipe line generally used for compressed air, and which was employed for ventilating the chutes and also supplying rock drills, was utilized for pumping water into the fire. A small electrically driven Fairmont pump was placed over the ditch in the Skidmore vein, and water sufficient for two lines of fire hose was forced into the fire. On account of the broken condition of the coal between the old slope gangway and the shaft gangway, it was found that the water percolated through the coal to the old slope gangway and could not be dammed up. When the hole through the fall had been driven, it was found that the fire was eating its way up in No. 19 chute and it was decided to seal up the gangway and cut off as much air from the fire as possible.

Culm was brought into the mines in cars, and the gangway was packed full, 197 carloads being used to seal it. Three wooden dams were built in the gangway to hold the culm in place, and water was pumped in back of these. The last dam was erected in a tunnel that was driven between the top and bottom splits and was 400 ft. outside of the fire. Three cars of clay were used in this dam. Fig. 3 shows the location of these dams.

There was now danger that the fire might spread and be difficult to confine. In order to quickly supply culm for the purpose of "slushing" and sealing off the fire wherever possible from the old workings, a pipe line was laid from the slush pump at the Coaldale breaker into the mines and up to the fire. This is shown in Fig. 2. An 8-in. pipe was laid for 2,150 ft. over the surface to a point near No. 9 water-level tunnel, where it was reduced to 6 in. and was laid in the tunnel to the water shaft, then to the second-level tunnel and in the gangway to the fire, a total distance of 5,200 ft. This pipe was collected quickly at the various collieries and shipped to Coaldale. The work was begun on Dec. 20 and completed Dec. 27, or in 6½ days.

Laying the 6-in. line to follow the turns and bends in the gangway was rather difficult work. This was particularly so in the chutes, for the pipe line makes nearly a complete circle at the bottom of several of the chutes. Pipe bends of 3- and 4-ft. radius and bevel rings, or dutchmen, were used to make the turns in the pipe lines. Full lengths of pipe were employed in the gangways, while the pipe was cut into 5- to 7-ft. lengths for use in the chutes, enabling the miners to keep the pipes close to the face of the chutes and headings.

A 2½-in. and 3-in. pipe line was laid in the gangway into the chutes that were driving in the bottom split. Over the ditch near the shaft a No. 9 Cameron pump was installed, which was run by compressed air and the water discharged through the pipe line to a relay pump which was installed in the turnout about 100 ft. inside of the tunnel from the Skidmore to the Bottom Split gangway. The relay pump was used to force water through a 2½-in. line into the fire, and also to pump culm and slush to cool off the old workings. Culm or silt was brought into the mine in mine cars to the relay pump. It was then shoveled into a wooden box and mixed with the water that was fed to the pump and forced into the holes that were being driven to seal off the fire. Slush from the pump at the breaker on Jan. 15 was pumped directly into the Top Split gangway and later into No. 22 chute.

When the fight to extinguish the fire in the Top Split was considered hopeless, work was immediately started from the gangway on the Bottom Split. The idea was to drive chutes up in the Bottom Split to an elevation of 914 ft. and then drive headings north through the vein and slush the openings below this level with culm and water. Chutes Nos. 21 and 23 were reopened, while

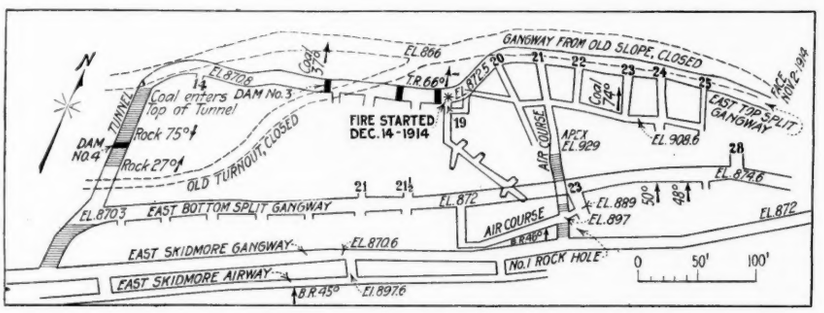



FIG. 3. LOCALITY WHERE FIRE STARTED AND DAMS THAT WERE BUILT TO SEAL IT OFF

Nos. 21½ and 22 were driven. Chutes Nos. 21½ and 22 were driven through the top slate, called the 18-in., and then slant chutes were driven across the pitch, connecting these at the top for the purpose of ventilation and also as escapeways. Chute No. 21 was connected with No. 18 from the Top Split gangway through a small hole which caved in, in No. 21 chute a short distance above the blue slate. Pipe lines 3-in. and 6-in. were laid to this hole and water and culm pumped into it until it overflowed.

Chute No. 23 was driven through the vein to the top of the blue slate and connected with chute No. 21 from the Top Split gangway. A pipe line was then laid up chute No. 23 and down chute No. 21 in the Top Split to the crosscut or stump heading and water and culm pumped into this heading until the mixture had filled the gangway to the level of the stump heading. From chute No. 21 it was 200 ft. to the face of the gangway in the Top Split.

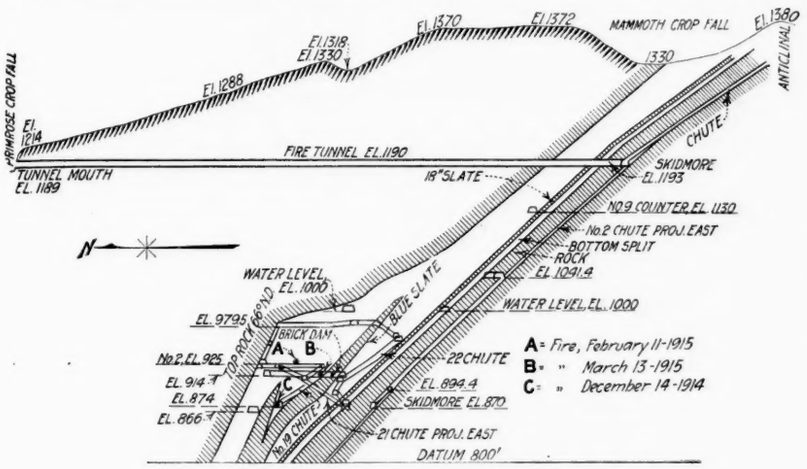



FIG. 4. CROSS-SECTION IN VICINITY OF THE FIRE

Chute No. 21 was inside of the fire, and by filling the gangway with culm and water the fire was prevented from going into the gangway and was confined to No. 21 chute. An 8-in. wooden pipe line was used down No. 21 chute and in the heading. When No. 22 chute was driven through the vein and through the blue slate, the hole struck gob composed of large rocks, and was turned to the west to more favorable ground. A small hole was then found, and this was filled with silt. Chute No. 21 was driven through the vein to an elevation of 925 ft., where the hole was started level toward the north—that is, toward the top rock. When the top was struck, the heading was driven along the top rock until it connected with the opening that had been driven from the apex of chute No. 23 between holes Nos. 2 and 3, which were driven to the south. At the apex of chute No. 23 a hole was driven west, following the top of the blue slate 40 ft. and then turned north through the vein to within 10 ft. of the top rock, where it was turned west and connected with the opening from chute No. 21. When driving this hole steam and gas were found issuing from the rib of the crosscut between chutes Nos. 22 and 21, which were driven from the gangway in the Top Split.

Culm and water were pumped into the heading at this point, filling the crosscuts and cutting off the steam. Small dams were also placed in the heading in hole No. 22 and water and culm run into these dams. The water running into the hole from No. 23 chute drove sulphur fumes down No. 22 hole. The water was then run alternately into No. 22 and No. 23 holes until the flow of sulphur fumes was stopped. The heading driven from chute No. 23 was continually dry and hot, and this was flooded frequently with water to cool it to a temperature that would permit the miners to work therein. Hole No. 3 was then driven south to split the pillar that was highly heated and to try to reach a point vertically over that where the fire originated. The outlook was now favorable to winning the fight on this level. By this time all the chutes from the top gangway had been cut and connected and no vestige of fire had been found in this level, but when No. 3 hole had been driven a short distance, it became so hot that it was necessary to flood it with water, as the loose material in the floor was at a temperature of 125 deg. When the hole had been advanced 30 ft., the miners could not work on account of the intense heat, and the passage was again flooded. This hole had been kept flooded for two days, when the fire was discovered to have burned through the top of the hole above the fore poles which had been driven at the face, the fire having worked outward toward the hole. The hole was immediately sealed up with plank stoppings and filled with culm.

Having received a knockout in the fight on this level, holes Nos. 1, 2 and 22 were bratticed off and filled with culm to seal off all the air possible. The fire having burned its way above this level, it was necessary to go to a higher elevation to attempt to cut it off. Two chutes were immediately started and driven up the pitch with all possible speed, No. 3 hole being midway between them. Two chutes were also started south of the fire from chutes Nos. 21½ and 22 from the gangway in the Bottom Split and followed the pitch of the vein for 80 ft., then turned north through the measure to an elevation of 938, or 58 ft. vertically above the level just abandoned. Other chutes were started east of the fire and driven across the pitch of the vein. On account of the heat and the broken and loose condition of the material through which they were driven, these slant chutes made slow progress. They were abandoned after the other chutes had been driven and connected across the vein.

Chutes Nos. 21½ and 22 were turned, and headings were driven north through the vein and had reached a point about 20 ft. from the top of Nos. 1 and 2 chutes when the fire broke out on this level. This time the fire in No. 22 hole was beaten back with water long enough to construct a wooden dam outside of an old one that had been previously erected, and the space between these two stoppings was filled with culm, sealing off the flames. A brick dam was then constructed outside of these dams and effectually checked all progress of the fire to the coal under the blue slate. The two chutes against the top rock and the headings being driven south from them were at the same time very hot, and it was necessary to flood them for several days each week in order to enable the men to work.

This condition continued until the headings were connected, which permitted better ventilation by circulating the air through the chutes from the gangway in the Bottom Split and returning down through the chutes that were driven along the top rock. Even with this increased quantity of air circulating, it was still quite warm, although much improved over the previous condition. In projecting the holes on the 983-ft. level, all

openings were driven on a down grade to permit flooding the workings without building dams. This was an important consideration when a condition might arise requiring the quick application of water. It also eliminated the needless delay and expense of constructing and dismantling dams.

The pillars on this level were reduced in size, being cut down to the smallest width allowable for the maintenance of the openings. This lesson was learned from the experience had in the level below. Where the fire broke through in the face of No. 3 hole, there was only 8 ft. of gob pillar separating Nos. 3 and 22 holes, and the fire passed above No. 22, through this small pillar. On the lower level 20 ft. of the pillar was maintained between the holes and on the upper level only 12 ft.

From the two main headings driven north and south through the vein, headings or crosscuts were driven east and west on a down grade, or dipping toward the face of the holes. As many headings were kept driving as possible with safety and without bringing on a squeeze. They were driven east and west until they were vertically over chutes Nos. 21 and 23 on the lower level, these being decided as the east and west limits of the area in which the fire might be, as no trace of it had been found at these extremes.

The headings were connected with crosscuts about every 16 ft., and when this work had been completed, the pump was started and these openings flooded on this level. The water was discovered coming through on the level below very hot, and it was found necessary to run the pump for two weeks before it cooled off. The dams were then taken out of the holes, and the lower level and holes were driven south to the blue slate and connected with holes driven along the top of the slate from chutes Nos. 21 and 23. The pillars east and west of No. 3 hole were also divided with crosscuts, and near the face of No. 3 hole cut into ashes on both ribs.

When all the holes on this level had been reopened and no signs of fire found, attention was again turned to the gangway in the Top Split, and this was reopened. In reopening the gangway at chutes Nos. 19, 20 and 21, the gangway timber was found to be badly burned. In several places it was entirely consumed and the gangway had caved in. Where these cave-ins were encountered, the culm was found to be packed tight, completely filling all crevices and apertures in the broken coal and slate. It had also completely filled the gangway at all other places except near its face, where the slush started tailing off, about half filling the passage. After a thorough inspection when no heat or fire had been found, it was decided on Aug. 15 that the fire had been extinguished, and the patrolmen returned to their regular occupation.

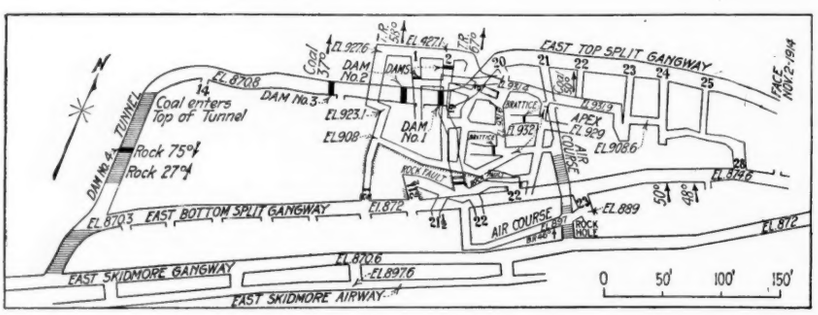



FIG. 5. DEVELOPMENTS IN FIGHTING THE FIRE FROM THE BOTTOM SPLIT GANGWAY

As a precaution while working on the 983-ft. level, three chutes were being driven in the Skidmore vein to reach a higher elevation than this level in case the fire should pass this point. No. 1 chute was to be driven across the pitch on an angle of 35 deg. to an elevation of 1,100 ft., or 117 ft. above the 983-ft. level. No. 2 chute was to be driven to an elevation of 1,043 ft., while No. 5 chute was to reach an elevation of 1,000 ft. No. 3 chute was to be used only if it was found impossible to work chutes up through the gob south of the fire. It was only driven up a short distance when it was decided to stop. A water-level tunnel was also started on the surface to reach an elevation from which, if necessary, the fire could have been fought.

In the development of fighting the fire an attempt was made to keep the openings as tight as possible and make a checker-board development in order to explore for the fire. This was found impracticable because of the loose coal and large rocks in the gob. These required that the bearings of the chutes and headings be frequently changed and follow the lines of least resistance, where speed in driving was the prime object. Thus, instead of chutes and headings being straight, they were extremely irregular.

### Chutes Were Driven in Pairs

The chutes in the vein were driven in pairs in order to secure ventilation and as a means of escape for the miners. These chutes and headings were ventilated by 3-ft. electrically driven 4-hp. fans, the air being conveyed through 10-in. galvanized pipe. Compressed air was also employed, being conveyed through 1-in. pipe.

Where it was found hot, the gob was flooded, the duration of flooding being determined by the temperature of the water flowing out; also all holes found in driving were flushed full of culm in order to seal off the air from feeding the fire. On this work three 8-hr. shifts were worked, 30 men being employed on each in driving chutes and headings and 6 on each carrying timber, pipes and supplies to the miners. There was also one assistant foreman, one fireboss and an assistant to the foreman, who patrolled the working places frequently and looked after the safety of the men. In the night there was a night foreman in charge. Fire maps and sections on a scale of 40 ft. to the inch were constructed, showing all the workings that were likely to be affected by the fire. These were posted weekly and blueprints made and furnished to the officers in charge of the work.

There was a total of 1,500 ft. of chutes and 2,000 ft. of headings or holes driven around this fire. The cost of extinguishing it was $125,000, less credit for pipe lines, pumps, etc., also a number of chutes and headings which can be utilized for robbing purposes.

With the exception of an explosion, there is nothing that causes such dread among miners as a mine fire. There is in such a case not only the danger to life, but also the danger of great financial loss, although mine fires do not attract public attention unless there are

numerous fatalities. A small fire, if at first neglected, will soon spread to a wide area, as is illustrated by the fires now burning at Coaldale and at Summit Hill, which are practically beyond extinguishing and have cost large sums. Had the fire in question spread much farther, cutoffs east and west would have had to be made, and this would have been an expensive operation.

The officers and miners who were engaged in this work are to be complimented for the vigorous fight that

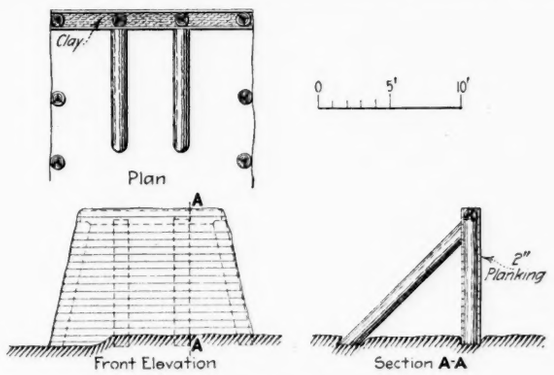



FIG. 6. THE CONSTRUCTION OF A DAM

was made, as there was no resting until the fire had been subdued. The work was carried on under conditions that were extremely hazardous, as there was danger of asphyxiation from sulphur; the men were obliged to work in intense heat, which often reached 130 deg. F., as well as the danger from falls which would have closed them in. But so well were precautions taken in regard to safety that not one accident occurred. This speaks for itself and shows the good judgment that was exercised during the fight.

## Freight Rates to Pacific Coast

Bids were opened by the Navy Department on May 25 for the transportation of coal either by rail or water to the Pacific Coast, with the following results:

The Atchison, Topeka & Santa Fe, Southern Pacific, Missouri Pacific and Union Pacific each bid $8.711 per ton. For shipment by water, Houlder, Weir & Boyd offered a vessel of 8,600 tons' capacity ready for immediate loading at $8.50 per ton, and McCall, Dinning & Co. offered a 9,000-ton steamer at $22.50 per ton. The bid of Houlder, Weir & Boyd at $8.50 per ton was accepted.

## American Mining Congress Annual Meeting

**The nineteenth annual session of the American Mining Congress will be held at the La Salle hotel, Chicago, Ill., during the week of Nov. 13, 1916.**

**The purpose of the convention will be to inaugurate plans by which all branches of the industry may work together in the solution of common problems. A general meeting will be held each morning, and the convention will then divide itself into Precious Metals, Iron and Steel, Oil and Gas, Lead and Zinc and Coal sections, each discussing subjects of special interest to its branch of the industry. The convention will occupy two whole floors of the LaSalle Hotel, and such space as is not utilized for meeting places will be available for exhibits or reception rooms by those directly interested in the convention. A program of varied interest is being arranged, and the largest convention in the history of the Congress is expected.**

## Anthracite Statistics for 1915

The production of anthracite in Pennsylvania in 1915, including that from Sullivan County, the washery product obtained from culm banks and that dredged from rivers, as reported to C. E. Lesher, of the United States Geological Survey, was 79,459,876 gross tons, valued at $184,653,498. Anthracite is used mainly as a domestic fuel, and the mild weather during the early months of 1915, a falling off in exports to Canada and very light buying by householders and retailers during the summer period of low prices all contributed to a decrease from the output in 1914. The production in 1914 was 81,090,631 tons, valued at $188,181,399, so that the decrease in 1915 was 1,630,755 tons, or 2 per cent., in quantity, and $3,527,901, or nearly 2 per cent., in value. The average value, $2.32 a ton at the mines, was practically the same in the two years.

Of the total production in 1915 (79,459,876 tons), 68,666,456 tons, or 87 per cent., was shipped outside the producing region, 1,867,934 tons, or 2 per cent., was consumed locally, and 8,925,486 tons, or 11 per cent., was used at the mines, breakers, washeries and dredges.

PRODUCTION BY COUNTIES AND VALUE

| | 1914 | | | 1915 | | |
|---|---|---|---|---|---|---|
| | | Value | | | Value | |
| County | Quantity | Total | Ton | Quantity | Total | Ton |
| Carbon | 3,042,284 | $6,663,821 | $2.19 | 3,045,042 | $6,707,243 | $2.20 |
| Columbia | 937,990 | 2,080,308 | 2.22 | 1,046,553 | 2,287,913 | 2.19 |
| Dauphin | 959,472 | 2,083,755 | 2.17 | 948,794 | 1,924,168 | 2.03 |
| Lackawanna | 19,976,625 | 48,386,068 | 2.42 | 19,782,745 | 46,137,560 | 2.33 |
| Luzerne | 32,337,712 | 75,220,771 | 2.33 | 31,035,534 | 75,996,913 | 2.35 |
| Northumberland | 5,997,121 | 14,129,779 | 2.36 | 5,667,195 | 13,137,428 | 2.32 |
| Schuylkill | 16,695,106 | 37,323,562 | 2.24 | 16,789,233 | 36,135,532 | 2.15 |
| Sullivan | 575,528 | 1,031,962 | 1.79 | 540,403 | 1,005,624 | 1.86 |
| Susquehanna and Wayne | 568,793 | 1,261,373 | 2.22 | 604,377 | 1,321,117 | 2.19 |
| | 81,090,631 | $188,181,399 | $2.32 | 79,459,876 | $184,653,498 | $2.32 |

ANTHRACITE SHIPPED IN 1914 AND 1915, BY SIZES, IN LONG TONS

| | 1914 | | | 1915 | | |
|---|---|---|---|---|---|---|
| | From Mines | From Washeries and Dredges | Total | From Mines | From Washeries and Dredges | Total |
| Lump and steamboat | 180,516 | ..... | 180,516 | 115,348 | ..... | 115,348 |
| Broken | 3,547,117 | ..... | 3,547,117 | 3,349,933 | ..... | 3,349,933 |
| Egg | 8,718,744 | 65 | 8,718,809 | 8,117,052 | 288 | 8,117,340 |
| Stove | 14,498,651 | 6,851 | 14,505,502 | 14,051,912 | 9,157 | 14,061,069 |
| Chestnut | 16,167,517 | 57,375 | 16,224,892 | 15,491,268 | 78,745 | 15,570,013 |
| Pea | 8,142,829 | 134,790 | 8,277,619 | 8,011,934 | 198,734 | 8,210,668 |
| Buckwheat No. 1 | 9,176,985 | 282,803 | 9,459,788 | 8,936,760 | 385,773 | 9,322,533 |
| Buckwheat No. 2 (rice) | 4,165,823 | 456,566 | 4,622,389 | 4,771,786 | 788,712 | 5,560,498 |
| Buckwheat No. 3 (barley) | 3,750,528 | 755,458 | 4,505,986 | 2,855,144 | 980,981 | 3,836,125 |
| Screenings | 378,765 | 42,663 | 421,428 | 472,680 | 50,249 | 522,929 |
| | 68,727,475 | 1,736,571 | 70,464,046 | 66,173,817 | 2,492,639 | 68,666,456 |

ANTHRACITE SHIPPED IN 1911-1915, BY MONTHS, IN LONG TONS

| Month | 1911 | 1912 | 1913 | 1914 | 1915 |
|---|---|---|---|---|---|
| January | 5,904,117 | 5,763,696 | 6,336,419 | 5,175,732 | 4,734,535 |
| February | 5,070,948 | 5,875,968 | 5,674,169 | 4,121,451 | 4,275,107 |
| March | 5,996,894 | 6,569,687 | 4,909,288 | 5,164,703 | 4,985,398 |
| April | 5,804,915 | 266,625 | 5,966,189 | 6,072,164 | 6,486,201 |
| May | 6,317,352 | 1,429,357 | 5,995,742 | 6,281,553 | 5,797,961 |
| June | 6,215,357 | 6,191,646 | 5,970,047 | 6,130,186 | 5,316,102 |
| July | 4,804,065 | 6,285,153 | 5,487,852 | 5,391,857 | 4,934,205 |
| August | 5,531,796 | 6,576,591 | 5,369,900 | 5,483,743 | 5,330,831 |
| September | 5,730,935 | 5,876,496 | 5,572,279 | 6,246,192 | 5,518,771 |
| October | 6,269,179 | 6,665,321 | 6,338,194 | 6,644,476 | 6,505,892 |
| November | 6,193,314 | 6,165,536 | 5,786,931 | 5,928,286 | 6,297,215 |
| December | 6,115,427 | 5,944,502 | 5,662,618 | 5,702,258 | 5,939,844 |
| | 69,954,299 | 63,610,578 | 69,069,628 | 68,342,601 | 66,122,062 |

CIRCULAR PRICES PER LONG TON FOR ANTHRACITE AT THE MINES, 1911-1915

| Size | 1911 | 1912 | 1913 | 1914 | 1915 |
|---|---|---|---|---|---|
| Lump | $3.50 | $3.50 | $3.50 | $3.50 | $3.50 |
| Steamboat | 3.00 | 3.00 | 3.00 | 3.50 | 3.50 |
| Broken (furnace)* | 3.50 | 3.50 | 3.50 | 3.50 | 3.50 |
| Egg* | 3.75 | 3.75 | 3.75 | 3.75 | 3.75 |
| Stove* | 3.75 | 4.00 | 4.00 | 4.00 | 4.00 |
| Chesnut* | 4.00 | 4.15 | 4.15 | 4.15 | 4.15 |
| Pea | 2.00 | 2.50 | 2.50 | 2.50 | 2.50 |
| Buckwheat | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Rice | .538 | .634 | .654 | 1.05 | 1.05 |
| Barley | .339 | .388 | .402 | .55 | .55 |

* Subject to 50 cents reduction in April, 40 cents in May, 30 cents in June, 20 cents in July, and 10 cents in August, except in 1912, when discounts were omitted during April and May.

# New Apparatus and Equipment

## The Oldroyd Mining Machine

A type of mining machine which might be termed "universal" has been invented by C. S. Oldroyd, of Knoxville, Tenn., and is being placed upon the market by the Oldroyd Manufacturing Co., of the same place.

As may be seen in the accompanying illustration, this device consists essentially of a cutter bar upon which the bits are arranged spirally, the bar being revolved and moved sidewise and vertically by power.

In the machine shown the bar may be made to cut at any height from on the floor to 7 ft. 7½ in. above it. The arrangement of the head is such that the cutter bar may not only be extended horizontally at any distance between the heights named, but may also be tilted at any angle. The result is that not only face cuts or those extending across the face of a room may be made, but also rib or shearing cuts of any depth up to the length of the bar.

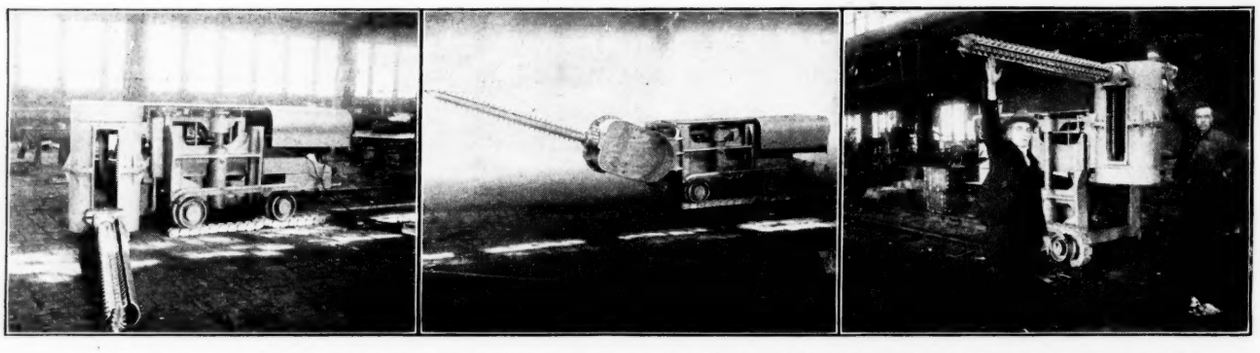
The cutter bar is driven at a speed of 450 r.p.m., while the lineal speed at the point of the bar may be made to suit the material being cut, the ordinary feed in coal being 42 in. per min. The length of the bar may also be made to suit conditions. The machine moves from place to place under its own power.

The Oldroyd mining machine is electrically driven, and all transmission is made by gears and worms with the exception of a chain drive between the two axles. All cutting is done without unloading the machine from its truck, which is built into and forms an integral part of the mechanism.

One ingenious feature of this device is the chain track upon which it operates beyond the end of the room track. This is well illustrated in the accompanying photographs and needs no further explanation. Another feature is the curved scraper that follows the cutter bar and forces it to withdraw the bug dust from the kerf. Both bar and scraper may be readily detached from the machine when this is necessary.

As may be readily seen, this apparatus is strongly and substantially constructed, being especially designed to stand the heavy and hard usage incident to operation in the mines. The first machine of this type, which differed considerably from the one here shown, has been in successful operation for several months in the mines of the Solvay Collieries Co. at Kingston, W. Va. The machine here shown was recently shipped to the Consolidated Coal Co. for use in eastern Kentucky.

The fact that the cutter bar may be made to work at any position between the floor and roof of the mine is of great advantage in working measures carrying partings of variable height. It will be readily perceived that in such a case the cut may be made in the parting regardless of either its position in the coal measure or the inclination it may take. This will be of great assistance in securing clean coal.



THREE VIEWS OF THE OLDROYD MACHINE, SHOWING SOME OF THE POSITIONS OF THE CUTTER BAR

## "Ko-Shovel" Stoking Machine

The stoking device shown in the accompanying illustrations has been perfected recently by the Goetz Co., of Chicago. It is designed to inject coal into the furnace in small frequent charges. Its operation is practically continuous, and as the fire-doors remain closed, combustion is carried on at a uniform rate with no sudden changes in temperature. There is no inrush of cool air such as occurs in hand firing, which is detrimental to high efficiency and which also has its effect upon boiler upkeep. Consequently the design of the "Ko-Shovel" is conducive to high economy in the furnace. The machine handles successfully any grade of fuel up to 1½-in. bar screenings or down to No. 5 washed or unwashed coal. Alternate charges of ½ and ⅜ lb. of fuel are fired by the strokes of the plunger, the lighter charge being thrown with greater force. The total quantity is determined by the speed of the engine or motor driving the stoking machine.

It is customary to install the "Ko-Shovel" either directly in the upper part of the fire-door opening or immediately above the door in the boiler front. The entering chute and the plunger require a space 5 in. deep. When the machine is installed in the fire-door opening, a new door is provided, so that it will not prevent or interfere in any way with firing by hand or with cleaning the fires through the fire-doors.

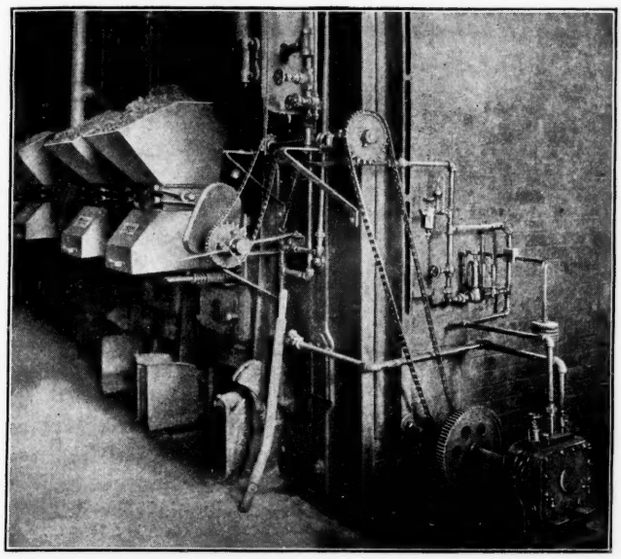


FIG. 1. THE KO-SHOVEL ON A BOILER FRONT

Reference to Fig. 2 will show the method of operation. Coal is fed into a hopper having sufficient capacity to run the boiler for about an hour. The amount of coal, or the number of charges entering the furnace, is determined by the speed of the driving mechanism, which may be automatically controlled by a steam-pressure regulator. The coal comes down through a crusher below the hopper and through a rotating coal valve, operating at one-half the speed of the mainshaft, and drops upon the horizontal piston, which injects the coal into the fire. By the cams shown in the drawing, the piston is pushed back to the end of its stroke. It will be noticed that there are two rollers on each cam and two lugs attached to the piston

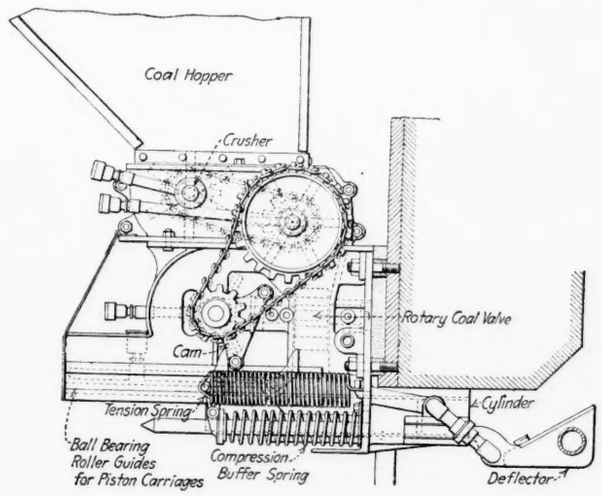



FIG. 2. CROSS-SECTION THROUGH THE STOKER

carriage for this purpose. After the piston is pulled back far enough the coal drops into the cylinder, and as soon as the cams break contact with the lugs, it is discharged with considerable force into the furnace by a tension spring on each side of the piston. Compression springs attached to the stoking-machine body absorb the shock and bring the piston gradually to rest. Upon leaving the cylinder the coal strikes a deflector plate and is distributed uniformly over the grate.

From Fig. 1, which is a view of an installation made on Heine boilers, it is evident that chain-and-sprocket drive is employed throughout. Improved combustion due to the small and frequent charges of coal and the burning of the fine dust particles before they have an opportunity to fall through the grate or pack together and shut off the air supply, the exclusion of excess air, the comparative cheapness of the machine and its ready application to any existing boiler front are the principal claims advanced by the exclusive distributor of the device, George A. Kohout & Co., 403 Monadnock Building, Chicago, Ill.

## New Haven Embargo Easier

In a circular addressed "To Shippers, Consignees and Trade Organizations" by the New York, New Haven & Hartford Railroad Co., it is said that it is the desire of the railroad to remove all embargoes on shipments into New England and to avoid further embargoes, but that this will depend largely upon the coöperation the company receives from its patrons. It is stated that during November and December, 1915, the average number of cars in position for unloading each day was from 10,000 to 11,000 and the average daily unloading was 5,500. During March and April of this year, notwithstanding an increase in the average number of cars in position for unloading each day—up to 12,000 to 13,000—the average daily unloading was only 4,200 to 4,300. Referring to coal shipments, the circular says:

> Last fall, when shipments of coal were ordered forward far in excess of consignees' ability to unload, these cars were stored on tracks that should have been kept for receiving, classifying and forwarding trains, thus making it more difficult to move freight of greater importance. Consequently patrons found shipments they desired were being delayed.

In a number of suggestions offered, "in order that better results may be obtained, embargoes lifted and the service restored to a more satisfactory condition," is the following:

> Get in your supply of coal for next winter during the season of favorable weather, commencing immediately, ordering shipments forward moderately and at a regular rate. It was the overbuying of coal in large quantities last fall that started the serious congestion during the past winter.

## COMING MEETINGS

**The American Mining Congress** will hold its 19th annual session during the week beginning Nov. 13, 1916, at Chicago, Ill.

**American Society of Civil Engineers** will hold its annual convention at Pittsburgh, Penn., June 27-30.

**Illinois and Wisconsin Retail Coal Dealers' Association** will hold its next annual convention on July 26 and 27 at Madison, Wis.

**Byproduct Coke Producers' Association of America,** formed in Chicago on Jan. 14 last, will hold its first annual meeting in Boston, Mass., on July 14, lasting probably two or three days.

**Canadian Retail Coal Association's** annual convention will be held on board boat touring the Thousand Islands on June 14 and 15. Secretary, B. A. Caspell, Brantford, Ont., Can.

**Michigan-Ohio-Indiana Coal Association** will hold its annual convention at Cedar Point, near Sandusky, Ohio, Aug. 1, 2 and 3. Secretary, B. F. Nigh, Columbus, Ohio.

**Pennsylvania Retail Coal Merchants' Association** will hold its twelfth meeting, June 20-22, at Harrisburg, Penn. Secretary, W. M. Bertolet, Reading, Penn.

**Rocky Mountain Coal Mining Institute** will hold its next meeting at Salt Lake City, Utah, June 14, 15 and 16. Secretary, F. W. Whiteside, Denver, Colo.

**The Mine Inspectors' Institute, U. S. A.** will hold its ninth annual meeting at Joplin, Mo., Tuesday, June 13, 1916. Secretary, James W. Paul, Pittsburgh, Penn.

# Editorials

## West Virginia Mining Institute

Much bluster has been recently made about efficiency, but the public generally has been slow to show any clear realization of the need for a deliberate study of the art of economy in time and effort. To attain it has not seemed worth the expenditure of much consideration or money. Efficiency in every part of the country seems to have attained at best a low valuation. It is all very well to prate about it, but if no one is willing to pay to secure it or to expend effort in obtaining it, the hope for its general accomplishment is still far distant.

This lack of interest was well illustrated at the meeting of the West Virginia Coal Mining Institute, at which only a few operators were present. When there is a session of mine operators in one of their exclusive associations to discuss business, labor, politics or compensation, there is a large attendance. Often the interest is such that there is no time to eat and discussions are carried far into the night.

The animation of mining men at such meetings contrasts with their listlessness at an institute session, from which indeed many of them stay away consistently. Those who go declare that they take no part because they do not want to make themselves conspicuous or because they object to doing all the talking, as if anyone cared what the opinions of others are when he is really interested or when there is something that should be said. It may safely be wagered that there is no diffidence like this at an operators' association meeting.

Perhaps it might be conceded that those operators who are not technical men might well be expected to absent themselves from such meetings or to find them dull and depressing when they do attend. Sales agents who have acquired mines and do not know much of the art of mining may well yawn when the technicalities of the profession are discussed, but if they are unwilling to make a study of the methods of mining and have decided to leave the matter to their technical men, surely they should be ready to assist these institutes with their funds.

Why should we be wrathful with the public when it declares that we are more anxious to gather shekels than to earn them? Let us rather be honest. Let us admit that we would rather attend a meeting to discuss what is the least wage concession we are prepared to make than spend our time at an institute discussing some way of making the margin of profit larger by some new economy.

Science of all kinds, and mining science in particular, will always be laggard if it is not generously assisted. When the managers and sales agents attend meetings, their dues, fees, railroad fares, hotel expenses, bellboy tips and what not are all paid. There is no stint.

On the other hand, the operating officials have a meeting to discuss the interests of the corporation for which they work, and those same officials pay every cent from their own pockets and are lucky if they are permitted to attend at all, so begrudging are the coal companies of both time and money.

No wonder that there is a low average of efficiency, a lack of imagination, a narrow parochialism among our mining engineers. No wonder the mining institutes do not build and educate as they should. The operator too often thinks they should be abolished. There are too many such affairs in his estimation and they take too much time. The same might be said about the little red schoolhouse. It also takes both time and money.

The institutes will be just what we make them. If we give them the cold shoulder, they will have only a cold shoulder to feast on. If we give them hearty support and carefuily control them so that none but speakers with a real story can take up the time of the institute, the associations will do worthy work. It is with that idea that the West Virginia institute has been asking for a donation of $10 from every mining company in the state. It should get what it asks and even obtain far more from those companies which are operating many mines.

## The Proposed Investigation of Anthracite Prices

The price of anthracite has gone up and the operators are to be investigated. Amidst all this delirium of investigation besetting the country the basic fact must ever remain that the selling price of any commodity must bear the cost of production. So it follows as a natural corollary that when the productive costs are boosted by a wage increase the price of coal must be made to respond to the rapidly mounting costs.

As evidence of increasing costs in the business it is interesting to consider the recent compensation law which became effective in Pennsylvania at the beginning of the present year. It must be remembered that the mine owners raised no objection to the law when it was being considered by the state legislature. As a matter of fact there can be no objection on the part of anyone to a measure that tends to recompense for the perils to which labor is exposed at industrial works. Such laws are but the evidence of our advancing civilization and tend to the ultimate good of all. But it costs money, and since in the final analysis all are benefited, it is but right that all should share in the cost.

A number of anthracite operators had been adding the Pennsylvania State tax as a separate item on their bills. Later, when it seemed likely that they would be relieved of this burden by the courts, some decided to continue this 2½ per cent. increase to meet the expenses of the compensation act, for which they were bitterly assailed.

And now it begins to look as if this slight increase will be far from enough to meet the increased costs entailed by the operation of the act. In a paper presented by Charles Dorrance, of the Hudson Coal Co., he states that the company's experience has shown that this bur-

den must be met by an increase of from 15 to 20c. on the prepared sizes of coal, as the steam sizes, in competition with bituminous coal, are able to carry but a small proportion of the load.

There are many such odd angles to the fuel business, but it is extremely difficult to convince a perennially recurring crop of investigators of the peculiar nature of the industry. With them business is business and can be regulated by a fixed rule.

Occasionally the newspapers have a story of some coal company whose statements show profits apparently incommensurate with the occupation of supplying a public commodity. Immediately the conclusion is reached that all coal is sold at an excessive profit. This fixes in the public mind a standard of ultimate cost despite any peculiarity in local conditions. It matters not if operations for some years previous have been conducted practically at a loss because of some fault developed in the coal seams or from other causes. Nor is the fact often taken into consideration that the large companies that have been in business for almost a century are facing continually increasing costs because of the greater depths. Public opinion is generally founded on the conclusion that if one man apparently takes a big profit in the mining business, everybody is doing the same.

So it is that the coal man has few friends. Perhaps the nearest thing to friendly comment was lately found in a bitterly antagonistic article in a metropolitan newspaper, which stated that "the anthracite ring had now been investigated for the past twelve years, with nothing accomplished." In the face of the real facts the newspaper in question could easily amend its statement with entire truth by saying that the only thing accomplished by such investigations has been to contribute appreciably to the production costs by thus usurping the time and money of the operators in defending their business investments.

## The Anthracite Market

The anthracite dealer's lot is an unhappy one. He had stocked so heavily, anticipating trouble at the mines, that his capital is all invested. Even when he has an opportunity to sell some coal he is so harassed with the labor problem, which continues acute in this branch, that he finds little satisfaction in doing business. Unless the dealers adhere to their resolution to eliminate price cutting, which is not so certain at this moment, their increased payrolls are sure to cripple them. High prices, especially for the smaller dealer, are the only salvation to pull him through this peculiar season. Their accounts with the shippers are not in good shape now, and credits are being scrutinized as never before. The collections are giving all shippers much concern.

With the business in its present state so early in June we regret that we cannot be optimistic as to the future. This should be a fairly busy month, but July and August appear to be hopeless, and the shippers are already getting their only solace out of the situation by predicting that it will be a busy fall.

The retail men are receiving offers for their "requirements" of prepared sizes on which June circular is to govern until Sept. 1; and while as yet no such agreements may finally be closed, there seems to be no doubt that quite a little business of this kind will be closed just as soon as the dealers have had time to assure themselves that a greater drop is not in sight.

It is reported that the large mining companies are seriously disturbed by the price cutting that is going on, and it would not be at all surprising if in the near future they discontinued issuing printed circulars. It is rumored that in their conferences last month the strongest contenders for an even higher price for coal were the individuals who maintained that they could not exist at the current rates. With the present conditions it looks like a lack of faith on the part of someone.

When one considers the time consumed by the operators and the dissatisfaction expressed by the public at the delay in announcing their May circular, amounting to almost disgust, it seems almost pitiful to see their final (?) decisions as to prices ignored within less than a month. A complete suspension of mining for six or eight weeks is probably what the market needs.

Under the present arrangement the miners are not satisfied, the shippers are uneasy and distrustful, the retail man is "up in the air," and the public feels that it is being gouged. Surely there must be something wrong with a plan that satisfies no one.

## New Anthracite Standard of Preparation

There is little doubt that plans are being made to change the standard of preparation. Nothing radical is likely until business shows an improvement, but it is probable that next fall, when the dealers are rushed and not so critical, important changes will be gradually slipped in. A large proportion of egg in stove and stove in chestnut will mean increased revenue to the companies without seriously affecting the value of these sizes, but when it comes to putting more of the smaller sizes in the larger, as pea in chestnut and buckwheat in pea, there is sure to be a strenuous objection.

With the standard of preparation as it is, the public is inclined to accuse the dealer of mixing the sizes to his own advantage and if the operators expect the dealers to quietly assume the responsibility for any further adulteration, they are doomed to disappointment. It is known that one of the largest retail companies has already employed an experienced inspector from the mining regions whose duty it will be to keep his employers informed as to the size and quality of the different grades of coal shipped to their yards by the various companies.

The companies now offering "boiler fuel" have struck a snag. Not a car of it has as yet been shipped, although some of the large shippers are known to have closed contracts for this grade. It seems that the railroad companies refuse to accept coal so billed. They state that they do not know such a size of coal, and so far as they know, the companies might load any size from barley to steamboat and call it "boiler fuel." The railroads point out that the freight tariffs specifically mention the sizes now in use and the rate is fixed accordingly. It now appears that before the new coal can be introduced, the shippers will have to fix a standard for this size and then request the railroads to issue a new tariff to cover it, unless some other method is found to get around the present ruling.

# Legal Department

## Rights Against Surface Owner

By A. L. H. Street*

In a recent decision the Alabama Supreme Court adjudicated several important legal principles bearing upon the rights of an operator as owner of coal underlying land owned by another, in the matter of removing coal from adjacent lands. (Bagley vs. Republic Iron and Steel Co., 69 Southern Reporter, 17.)

The title to coal underlying plaintiff's land was conveyed to defendant, "together with the right to mine said coal, . . . the right-of-way for all necessary roads, and all other rights and privileges which may be necessary for the proper mining and transportation of said minerals." Defendant also acquired adjoining lands and opened an airshaft on the particular land to ventilate its mines, which ramified both the particular land and the adjoining tract. The openings to the mines were on lands other than the particular tract, but the entries, following the seams of coal, had been extended to the particular land, and a part of the coal thereunder had been mined. These entries were used for laying tram tracks over which coal, not only from the lands in question, but from the other lands, was hauled to the tipple.

Plaintiff brought suit to enjoin use of entries under his land for transportation of coal from other lands, to enjoin use of the airshaft and its equipment for ventilation of the adjacent lands, and to prevent dumping on his surface of refuse from the adjoining lands. In dismissing the suit the Supreme Court denied injunction against such deposit of refuse, on the ground that the practice had been discontinued by defendant before the suit on request and its resumption was not threatened. The other branches of the case were determined against plaintiff on the ground that the defendant had acted within its legal rights. The general law of the case was summed up in the following language:

"In the case of Schobert vs. Pittsburg Co. [an Illinois case], it was decided that a grantee of coal in place, such as is appellee in this case, with irrevocable and perpetual license to mine and remove coal from the land in which the coal is located, had the right, as an incident of such license, to use the space made by mining the coal, for the purpose of removing coal taken from other and adjoining mines. There are limitations to this rule and this right, such as pointed out by this court in the case cited. This rule does not apply of course to mere lessees of land or of the surface where the lease or grant is for the express purpose of transporting only the coal on or under such land, nor does it apply to cases where the time during which the right to use the land is limited. . . . 'The right of transporting coal from adjoining lands through or over leased land exists, however, only so long as the coal conveyed is in good faith being mined. It would be a perversion of the intention of the parties to use such passageways merely and only for the purpose of reaching other coal. . . . The owner of the land above and below has a right to the reversion of the space occupied by the coal within the time contemplated by the parties when that coal is removed.'"

Several weeks ago the United States Circuit Court of Appeals for the Eighth Circuit reached a decision which at first might seem to be contrary to the principles stated, but the language of the opinion (Sharum vs. Whitehead Coal Mining Co., 223 Federal Reporter, 282), as well as the facts, plainly distinguishes the principles involved in the respective cases. In the Federal case mining operations were carried on under a lease, which expressly provided that the premises should not be used by the lessee company for any other purpose than that authorized in the lease. Under such circumstances the Court of Appeals recognizes the right to enjoin removal of coal from adjoining lands through tunnels and shafts on the leased land, as well as the right to enjoin deposit of refuse from the adjoining tract.

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## Recent Judicial Opinions

**When Operator Is Not Liable for Injury**—The rule of law which requires an employer to furnish his workmen with reasonably safe places for work does not apply to a miner engaged in removing coal from a mine room under assumption of the duty of propping slate himself. (Kentucky Court of Appeals, Crabtree's Administrator vs. Stearns Coal and Lumber Co., 181 Southwestern Reporter, 615.)

**Kentucky Prop Law Applied**—Under a law requiring an operator to deliver props selected and marked by miners with their own numbers, a coal company is not liable for injury to a miner because of failure to deliver to him props selected for him by another miner and marked with the number of such other miner. This conclusion is not to be affected by the fact that there may have been a custom in the mine permitting miners to select props for each other, for a custom can never override the express requirements of a statute. (Kentucky Court of Appeals, Legere vs. Sneed & McGuire Coal Co., 181 Southwestern Reporter, 617.)

**Validity and Effect of Iowa Workmen's Compensation Act**—The provisions of the Iowa Workmen's Compensation Act which abrogate the defenses of assumption of risk and negligence of a fellow servant in actions against employers who have elected not to comply with the compensation features of the law are not unconstitutional. But the act does not preclude an employer from showing that an accident sued upon was not due to negligence attributable to him. (Iowa Supreme Court, Hunter vs. Colfax Consolidated Coal Co., 154 Northwestern Reporter, 1037.)

**Indiana Place of Refuge Law**—A section of the Indiana coal-mining law reads: "On all single-track hauling roads wherever hauling is done by power, . . . upon which the persons employed in the mine must travel on foot to and from their work, places of refuge must be provided in the side wall, not less than 3 ft. in depth, measuring from side of car, and 4 ft. wide, and not more than 20 yd. apart, unless there is a clear space of at least 3 ft. between the side of the car and the side of the wall." Held, in an action by a miner to recover for injury resulting from noncompliance with the statute, that he is not required to show that it was practicable to construct places of refuge. The word "wall," as used in the quoted section, includes an artificial wall formed by rocks and old timber placed between props and does not necessarily mean the rib of mineral. (Indiana Supreme Court, Coakley vs. Vandalia Coal Co., 111 Northeastern Reporter, 426.)

# Discussion by Readers

## To Stop Heavy Flow of Water in a Borehole

*Letter No. 1*—Replying to the question of "J. H.," *Coal Age,* May 13, p. 858, asking for the best method of stopping the flow of water in a borehole 378 ft. deep, the water coming from a seam 70 ft. below the surface, I assume that what is wanted is some means of stopping the water from draining into the mine. I have seen two methods used that proved equally effective.

The first method consisted in selecting a good prop having a diameter about 1 in. greater than that of the borehole and being about 1 ft. longer than the height of the opening as measured from the floor to the roof. The post was first tapered for a distance of about 10 in. at one end, so as to permit that end to be inserted into the hole in the roof. This left the post the full size for a distance slightly greater than the height of the opening. Then, having inserted the tapered end of the post into the hole in the roof, the other end resting on the bottom is driven up with a sledge until the post is in an upright position.

The second method consists in taking a short piece of pipe to which a valve is attached for shutting off the flow of water after the pipe has been secured in the hole in the roof. The diameter of the pipe should be about the same as that of the hole. The pipe must be forced up into the hole by means of a long prop used as a lever. The valve in the pipe should be kept open until the latter has been made secure, so that, when the valve is closed, the pressure of the water will not force the pipe out of the hole.

The water pressure, in this case, may become at least $0.434(378-70) = 133.67$ lb. per sq.in. When the valve is closed, the total pressure on the valve tending to force the pipe out of the hole will then be $133.67 (0.7854 \times 6^2) =$ say 3,779 lb.

Should it ever be necessary to drain the hole, owing to the water's finding its way into other portions of the mine and causing trouble, the pipe with the valve will be found most convenient, since the prop when once set is difficult to remove and the flow of water cannot then be controlled. E. F.

Spangler, Penn.

## Effect of Fall of Barometer on Emission of Gas

*Letter No. 4*—Referring to the assumed proposition offered by "Reader," in respect to a circulation of air produced by a fan, and the effect a fall of barometer would have on this circulation, *Coal Age,* Apr. 29, p. 767, permit me to offer a few comments from the standpoint of a fan engineer, hoping that the same may be of interest, although some of the points discussed have been previously treated in *Coal Age.* The proposition reads as follows:

**Assume a large gaseous mine that is well ventilated by a fan running at a speed of 239 r.p.m. and producing 165,000 cu.ft. of air per minute under a water gage of 4.2 in., measured in the fan drift. The main air current is divided into six separate splits, thereby providing good ventilation in the several districts of the mine. The coal is 5 ft. thick, and we will assume that there is an abandoned area of 50 acres that has been worked out and is still standing, giving an opportunity for the accumulation of considerable gas. Now, assume that the barometer falls 1 in. in a single shift of 8 hr.**

Before answering the five questions asked by this correspondent, let me anticipate the solution of his problem by a brief calculation, as follows: The total air space contained in an abandoned area of 50 acres, in a 5-ft. seam of coal, will be $50(43{,}560 \times 5) = 10{,}890{,}000$ cu.ft. Now, assuming the net air space available for the accumulation of gas in this area to be, say 5,000,000 cu.ft., so as to make suitable allowance for any possible falls or roof settlement that may occur, we have 5,000,000 cu.ft. of air and gas subject to expansion caused by the drop of 1 in. in barometric pressure assumed by correspondent.

For a constant temperature, according to Boyle's law, the volume of air or gas varies inversely as the pressure it supports, which gives for the amount of gas thrown out onto the airway in this case, $5{,}000{,}000\left(\frac{29.3}{28.3}-1\right)$ = say 176,600 cu.ft. But, since this fall of barometer takes place in 8 hr., the flow of gas from this abandoned area would be at the rate of $176{,}600 \div (8 \times 60) =$ say 370 cu.ft. per min. At first this outflow appears to be insignificant in comparison with the volume of air passing on the airway, even assuming that it is pure methane. However, when it is realized that the most explosive mixture of methane and air contains less than 10 per cent. of gas, and that an explosion can take place when 5 per cent. of gas is present; or, again, a violent combustion of the mixture, resulting in a serious dust explosion, may occur when but 1 per cent. of gas is present, provided the fine dust of a highly inflammable coal is floating in the air, it becomes evident that such an outflow of gas-laden air from an abandoned area may constitute a grave element of danger, especially if the section of the mine affected is poorly ventilated. With this preface, in explanation of the general situation, I would answer the questions in the order they are asked, as follows:

**1. How will a sudden fall of barometric pressure affect the speed of the fan, the power applied to the fan shaft remaining constant?**

A fan impeller, running at a fixed speed, has a constant peripheral velocity that develops a pressure in proportion to the density of the air passing through the fan. The pressure so developed includes both the static pressure, which is an index of the mine resistance and the velocity head, both of which, it may be assumed, will decrease gradually during the 8-hr. period marked by the fall of barometer. I assume that both of these pressures decrease in the same ratio as the barometric pressure, or $(28.3/29.3)100 = 96.58$ per cent.

But a drop of static pressure, which is due to the resistance of the mine, indicates a decrease in the quantity of air passing in the ratio of the square root of the pressure, according to the well-known laws of ventilation, which makes the resulting quantity $\sqrt{0.9658} = 98.28$ per cent. of the original quantity. Then, since the effective power, or the power on the air, is proportional to both the quantity of air in circulation and the unit pressure, the resulting effective power for a constant speed of the fan would be $0.9658 \times 0.9828 = 0.9492$, say 95 per cent. of the original power on the air, which shows a decrease in the efficiency of the fan of practically 95 per cent. at the end of the 8-hr. period, when maintaining a constant speed under the reduced atmospheric pressure. As a matter of fact, however, the change in efficiency is very slight; and as the question states that the power applied to the fan shaft remains constant, the power on the air is also nearly constant, and the speed of the fan must increase in the ratio of the cube root of this power, $\sqrt[3]{100/95} = 1.017$. That is to say, for the same power applied to the fan shaft at the end of the 8-hr. period, owing to the drop of atmospheric pressure, the speed of the fan would be increased 1.7 per cent., making $239 \times 1.017 =$ say 243 r.p.m.

2. Will there be any change in the water-gage reading on the fan drift?

As previously explained, I assume that, for a constant speed of the fan, the static pressure marking the mine ressitance would drop to 96.58 per cent. of the original pressure, and the water gage on the fan drift would naturally show the same decline, which gives $4.2 \times 0.9658 = 4.056$ in. But estimating the water gage as proportional to the square of the speed of the fan gives $4.056(243/239)^2 = 4.19$ in. In my opinion, however, the effect of the expansion of the mine air would be to slightly lower the water-gage reading, as the potential energy of the air in the mine would provide sufficient force to expel the extra volume of 370 cu.ft. per min. I believe this would be accomplished by a slight reduction in the volume of air entering the downcast shaft and a slight increase in the amount of air leaving the upcast shaft.

### Illustrating the Potential Energy of Expanding Air

To make my point clear, suppose for a moment that the fan is stopped and the mine tightly sealed by closing the mouths of the two shafts at the beginning of the 8-hr. period. Under these conditions it is evident that, at the end of the 8-hr. period, the barometric pressure outside of the mine would be 1 in. below the mine pressure, and this difference in pressure would correspond to 13.6 in. of water gage, since mercury is 13.6 times as heavy as water. Then, upon making a small opening through one of the covers at the top of the shaft, air would issue from the mine at a velocity of 14,800 ft. per min., by reason of the potential energy stored in the mine air. Under the actual conditions existing in the mine, however, this potential energy is liberated slowly, effecting a slight reduction in the water gage on the fan drift as stated.

3. What effect will be produced on the volume of air entering the mine? If this volume remains unchanged, will there be any increase in the volume of the return current due to the fall of barometric pressure, the measurement being taken on the main return airway close to the mine outlet.

As stated in the answer to the second question, I assume that the volume entering the downcast would be slightly reduced to, say 164,500 cu.ft. per min. Estimating the volume of air handled by the fan as being proportional to its speed, this volume would be 165,000 (243/239) = 167,760 cu.ft. per min., and adding to this the quantity of air expelled from the mine by the potential energy due to the expansion of the air in the abandoned workings, namely, 370 cu.ft. per min., gives for the total volume discharged from the mine 168,100 cu.ft. per min.

4. Will there be any material change in the ventilating pressure near the working face, and if not, what do we understand is the cause of the expansion of the air and gas in the old workings, causing an outflow therefrom into the main airways?

It may be assumed that the ventilating pressure at the working face declines regularly at the same rate as in the fan drift where the pressure, at the end of the 8-hr. period, has been shown to be 4.19 in., having dropped from 4.2 in. at the beginning of this period. The ventilating pressure at the working face will decline at the same rate.

5. Finally, if the water gage on the fan drift remains constant, will the fall of barometric pressure have any effect in the mine?

A fall of barometric pressure always has the effect of making a mine more dangerous when the old workings contain inflammable gases, which then flow out into badly ventilated sections of the mine, where they may become ignited on the lamp of the miner.

Detroit, Mich. Thomas Chester.

## The Miner and Safety First

*Letter No. 13*—In the discussion of the conditions that affect the safety of mining mention has frequently been made that mine explosions in which large numbers of men have lost their lives rarely occurred in the "old days." The reasons given in support of this claim are mainly the following: A better grade of miners then working in the mines; the use of less powder per ton of coal mined; the shooting of coal with squibs instead of fuse, necessitating the better tamping of the hole; and finally, better discipline maintained in the mine formerly than now.

Undoubtedly the practices and conditions here mentioned combined to make mining safer in the early days of the industry than at the present time, but one can hardly admit the claim that large mine disasters were formerly of such infrequent occurrence. This might be true for the United States alone, where the records show comparatively few large fatal accidents in the mines prior to 1897. The chief reason for this fact, however, is that there were few large coal operations, and coal mining was then done on a much less extensive scale than now. Formerly an operation employing from 40 to 50 men was considered of as great importance as one now employing from 300 to 400 men.

In order, therefore, to obtain a just comparison, one must refer to the great disasters that have occurred in former years in Great Britain, where coal mining was prosecuted on a much larger scale and where the mines employed a greater number of men. The men working in those mines were as capable as those now employed in the mines in this country, and their discipline exceeded what is common in American mines. Notwithstanding

these facts, the records show that prior to 1897, at least 45 explosions had occurred in the mines of Great Britain, where more than 50 men lost their lives. In 25 of these explosions the fatalities numbered 76 or more. Following is an incomplete list of these disasters:

| Date of Explosion | Locality | Lives Lost |
|---|---|---|
| Sept. 14, 1812 | Felling | 92 |
| June 18, 1835 | Wallsend | 102 |
| Sept. 28, 1844 | Haswell | 95 |
| 1849 | Aberdare, Wales | 95 |
| Feb. 18, 1854 | Ince Hall | 89 |
| July 15, 1856 | Cymmer, Wales | 114 |
| Feb. 19, 1857 | Lund Hill | 189 |
| Mar. 1, 1860 | Burradon | 76 |
| Dec. 1, 1860 | Risca, Wales | 142 |
| Dec. 12, 1866 | Oaks colliery | 334 |
| Dec. 13, 1866 | Talk o' the Hill | 91 |
| Nov. 8, 1867 | Ferndale, Wales | 178 |
| Nov. 25, 1868 | Hindley Green | 62 |
| June 10, 1869 | Ferndale, Wales | 53 |
| July 21, 1869 | Haydock | 59 |
| Sept. 6, 1871 | Moss collieries | 70 |
| Dec. 6, 1875 | Swaithe Main | 143 |
| Oct. 22, 1877 | Blantyre | 207 |
| June 7, 1878 | Hayward Wood | 189 |
| Sept. 11, 1878 | Abercarn, Wales | 268 |
| Jan. 13, 1879 | Dinas colliery, Rhonnda Valley | 63 |
| July 15, 1880 | Risca, Wales | 120 |
| Sept. 8, 1880 | Seaham, Durham | 164 |
| Dec. 10, 1880 | Penygraig, Wales | 101 |
| Feb. 16, 1882 | Trimdon Grange, Durham | 74 |
| June 18, 1885 | Clifton Hall | 178 |
| Dec. 23, 1885 | Mardy, Pontypridd | 81 |
| Feb. 6, 1890 | Llanerch, Wales | 176 |
| Mar. 10, 1890 | Morfa, Wales | 87 |
| Aug. 26, 1892 | Park Slip, Wales | 112 |
| Apr. 11, 1893 | Great Western colliery, Pontypridd | 71 |
| July 4, 1893 | Combo, Thornhill | 139 |
| June 23, 1894 | Albion, Wales | 290 |

In 18 of these explosions there was a loss of over 100 lives. The Oaks colliery explosion, Dec. 12, 1866, took a toll of 334 lives and was followed the next day by a disastrous explosion in the Talk o' the Hill colliery, when 91 lives were sacrified. It will be noted that these explosions occurred in every month of the year, except the month of May.

H. PFOHL.

Pittsburgh, Penn.

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*Letter No. 14*—In discussing the subject of "The Miner and Safety First" I want to refer to two incidents that occurred in my own personal experience with men who think they know. These all belong to a class of men who are not afraid to assert their superior knowledge and act upon it in opposition to the more mature judgment of others in the mine.

The first incident is one that occurred in a mine where three men were drawing back a pillar that was nearly finished. An hour or so before quitting time there remained but three or four cars to load, but the older and more experienced of the three men said they had better draw their road and go home, as the place was not safe. This remark was met with a rebuff from one of the other men, who exclaimed, "The place isn't going to cave; I could sleep under this roof tonight," and they proceeded to load their cars, two at a time.

They had just got them "bed-loaded," and started to "top off" with the lump, when the roof above them broke without warning and fell. The older man was caught under the fall and crushed beyond recognition, while the man who knew it all escaped with slight injury. He learned a lesson, however, that he will never forget, but it was at the cost of a comrade's life. There are plenty of other men in the world, especially in coal mines, who know, as did this man, and their knowledge exceeds their judgment.

A somewhat similar instance is that to which reference has already been made in *Coal Age*. In the district where I was employed the fireboss, on making his second examination of the working places, discovered a loose piece of rock in a miner's place. Calling the attention of the miner to the danger, he instructed him to secure the roof with a post before doing any more work. The fireboss then proceeded on his way, but had not gone a great distance when he was told the man was killed by the piece of rock falling on him, as he had failed to quit his work promptly and set the post as instructed. This man knew best himself, and his knowledge also exceeded his judgment.

The fireboss, in this case, was arrested for failing to fulfill his duties according to the mine law, as it was claimed that the law requires the fireboss to see that all places are safe before leaving them. To do so, however, he could not complete the second examination, which the law requires "shall be made, during working hours, of every working place where men are employed."

It is sad to think that had these two men to whom I have referred not known so much themselves, and deferred to the judgment of others, two fathers and husbands would still be living today and caring for their families.

SAMUEL JONES.

Madera, Penn.

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*Letter No. 15*—Some of the correspondents in *Coal Aye* seem to think that the miners have not been wakened to the importance of "safety first" and some think that the operators are slow about taking up their end of the movement. All this impresses one with the feeling that the safety-first movement will not attain its maximum of usefulness until there is coöperation between workman and employer. As "Miner" in his letter No. 10, says, "It is time that the miner put into practice his talk of safety first," and further, it seems to me that it is high time everyone on the job did his part in that direction.

### SAFETY FIRST NOT PRACTICED IN THE MINE

Having had occasion recently to visit a large copper mine very often, I have observed that there are safety-first signs posted everywhere about the works and in the mine. At this mine there is a box into which the men are invited to put their written suggestions of changes for the sake of safety. On one occasion I went down with the men at the beginning of the shift. There were no manholes in the side of the entry and barely standing room along the side of the road at any point. If a man happens to have on a loose jumper he must watch it very closely while a trip of cars is passing. There is only one way for the men to get to their working places, and that is along the main haulway. I was impressed with the fact that the motormen did not give the men time to get to their places before starting their trips. A motor approached pulling a train of cars at full speed while there were more than fifty men scattered along the road. I was surprised when informed that this is a customary practice at this mine.

In the upper level of this same mine and under the stope area, portions of the drifts are badly caved and dynamite is used extensively to open closed chutes. Twice in the past two weeks a foreman has crawled into shots of this kind and was only saved by the fact that he had not got closer to the shot. There seem to be no steps taken to warn the men when shots are fired.

Two surveyors were entering a place in the mine about a week ago to do some work. There was a crosscut about ready to hole through into the drift along which the surveyors were passing. About a hundred feet back of the point at which the crosscut was expected to hole through they were stopped by a man who said there were some shots lighted in the crosscut, but that the surveyors would have time to pass if they would hurry. When the men were about ten feet past the place the shots went off, breaking the crosscut through. It was a very narrow escape.

Can safety first accomplish its part when men and company alike permit such things to happen repeatedly?

——, Nev. MINING ENGINEER.

## The Efficient Fireboss

*Letter No. 9*—It was with some amusement and no little astonishment that I read the reply of Edward H. Coxe to the letter of "Old Fireboss," *Coal Age,* May 20, p. 895. Surely, Mr. Coxe has not been a fireboss, or he would not have spoken so lightly in referring to the dangers encountered by that official.

Judging from his remarks in regard to walking 12 mi. underground and doing considerable work besides, I am constrained to say that his conception of the work of a fireboss must be absurd. It is very true that Mr. Coxe may have walked the same distance in less time and done much other work, but I vouchsafe the assertion that in doing so he was not obliged to creep cautiously over the top of an old gob in search of gas, or to climb to the top of a high fall, where not one in fifty mining engineers would dare to venture. But these are only a few of the dangers the fireboss must face when making his rounds through the mine in the early hours of the morning.

I suggest that it would open Mr. Coxe's eyes, and probably change his views on this matter, if he would accompany a fireboss on a single run in one of the 3-ft. seams in Pennsylvania. Let him go through a single entry, where there are 16 or 18 rooms, some of them up 300 ft. and over, and others on pillar work. There may be one or two falls to examine, and a brattice to be reset that has been torn down by the shots of the night before, and frequently he must spend some minutes erecting a special brattice to sweep away the gas accumulated at the top of a new fall. If unable to do this, he must, perhaps, go some distance to find a danger board to mark the entrance to the place. While doing so he is always conscious that his 3 hours' time or less is fast slipping away.

### THE EXHAUSTED FIREBOSS IS OFTEN TEMPTED TO SLIGHT HIS WORK

Many a time I have had to drop on my knees when halfway up a long room and wonder how much farther it was to the face, while the perspiration was running into and blinding my eyes. Then is the time when the temptation is strong for the fireboss to miss some places and assume that they are "O. K.," which has proved the downfall of a man in more cases than one. If a fireboss can withstand this temptation, I consider he is all right.

While I do not think firebosses are, in most cases, "underpaid," I am convinced that an efficient fireboss earns all he receives. In my opinion, a fireboss must be the most trustworthy, honest and truthful man in the mine, because the lives of the men working there depend on his doing his duty and properly performing the work in his charge, before allowing a man to enter the mine.

In closing, permit me to say that before one attempts to criticize the work of another, he must himself have performed that work under the same circumstances and conditions and be thoroughly familiar with its difficulties and dangers. I am willing to admit that there may have been statements in the letter of "Old Fireboss" that would seem far-fetched. At the same time, there was a lot of truth in his statements, particularly when he mentions having too many men to look after. I have firebossed for 120 men myself, but could not say whether it was 12 or 20 mi. I had to walk. However, I always felt that I had earned my money on reaching home, and was as ready to take a rest as any machine runner or other mine worker. THOMAS HOGARTH.

Reynoldsville, W. Va.

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*Letter No. 10*—Referring to letter No. 6, *Coal Age,* May 20, p. 895, I am of the opinion that the writer's knowledge of coal mining is very limited, at least from a practical standpoint. Theoretical training is an essential feature of a mine official's make-up, but it is of no avail if he is lacking in practical knowledge of mining work.

Many of the statements made in this letter are quite true, but does the writer mean to say that any efficient fireboss would examine for gas with an "open light," when the law specifically states that "he shall use no light other than that inclosed in an approved safety lamp?" While I will not dispute the fact that he will find the gas as quickly with an open light, and perhaps quicker, I can assure him that he will not be able to make a report of the same. In this respect it appears to me the writer attempts a humorous strain, as no fireboss in Pennsylvania could be assumed to carry an "open light" when making his examination of the mine.

### THE HAZARD IN FIREBOSSING GREATER THAN IN OTHER MINING WORK

The statement that he does "not regard his [the fireboss'] job as being as hazardous as that of a miner, machine runner, driver or motorman" cannot be taken seriously when one considers that, according to the mining law of Pennsylvania, the fireboss must examine all working places and falls, roadways and old gobs adjacent to live workings, and must complete his examination within 3 hr. prior to the time for the men to enter the mine. It should be clear to anyone that, working under these conditions and fulfilling these requirements, the fireboss has not much time to look for dangerous roof and to hesitate when climbing falls to examine for gas. It must be remembered, also, that should he meet with an accident, no one is present to render him assistance.

In closing, I would advise the writer of letter No. 6 to familiarize himself more fully with the different methods and conditions that exist in the various coal-mining districts of the United States before offering a criticism on the work of one who has been long in the harness. R. W. LITTLEHALES.

Wyano, Penn.

# Inquiries of General Interest

## Steam vs. Compressed-Air Line

At the colliery where I am employed there is a steam line several hundred feet in length, transmitting power to no less than five different engines located at various distances from the power plant, where 900 hp. is generated at a pressure of 125 to 150 lb. gage.

The steam or transmission line consists of 2,600 ft. of 6-in. pipe carrying the steam to a point where the first engine is located. At this point the line divides. A 4-in. pipe 4,700 ft. long is used to convey steam to a slope engine located underground. From the same point a branch line carries steam 1,500 ft. through a 5-in. pipe to where the line is tapped by a short 2½-in. branch 500 ft. long, which carries steam to the fan. The main line then continues for 500 ft., the size of pipe being reduced from 5 in. to 4 in. Here is located another hoisting engine, and beyond this the line extends through a 3-in. pipe 1,100 ft. to a second slope hoist, which is also located underground.

The diagram shows the relative lengths and sizes of the pipes and the location of the several engines and fan to

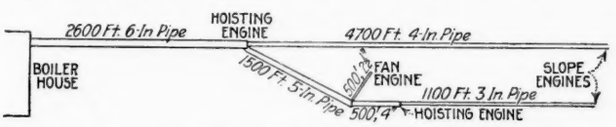


DIAGRAM SHOWING DIMENSIONS OF PIPE LINE

which steam is supplied. The question I want to ask is, Would not a compressed-air installation give better service in this case? The steam pipes are well laid and covered; but, in my opinion, it would be better to install a large compressor capable of supplying air to all the engines mentioned. The main objections to the use of steam, in this case, are the great length that power must be transmitted and the annoyance caused by the steam pipes in the mine entries. I submit this proposition in the hope that some of the readers of *Coal Age* will give their experiences under similar circumstances.

INSIDE FOREMAN.

Trevorton, Penn.

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In considering the transmission of power by compressed air in place of steam, it may be remarked that the question is not wholly one of cost of installation. The losses experienced in the transmission of power by steam, owing to the constant radiation of heat from the steam line and the condensation of steam within the pipe, in addition to the inconvenience experienced in consequence of the alternate expansion and contraction of the pipe lines, water-hammer, and the necessity of providing for the drainage of the pipes and the trapping and removing of the water of condensation, strongly recommend the use of compressed air in all long transmission lines.

The same engines can be used without alteration, except that it may be more economical to employ a lower initial pressure in air transmission than that required in the use of steam. Compressed air will, however, generally require a later cutoff than steam, in the development of the same power. Compressed air evidently possesses a great advantage over steam, also, when the power is to be used intermittently, since there is not the same loss from heat radiation and condensation during the intervals of idleness. We shall be glad to have this question further discussed by those who have experienced the benefit of the change from steam to compressed air for long-distance transmission of power.

## The Waynesburg Seam of Coal

Can you give me any information regarding the Waynesburg seam of coal, which overlies the Pittsburgh coal 400 ft. below? The seam is 5 ft. in thickness, and I would like to inquire in respect to its coking qualities and its desirability as a steam coal. Also, kindly state if the removal of the coal from the Pittsburgh seam will seriously affect the working of the Waynesburg coal. Will the latter coal bring as much on the market as the former when sold for steam purposes?

New Salem, Penn. F. R. NICELY.

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The most that is known of the Waynesburg coal seam is to be found in the reports of the Geological Surveys. The coal was well spoken of in Garrett County, Maryland, where it was sold for local consumption. The Maryland Geological Survey says: "It is a persistent formation of considerable economic importance"; but since the coal is not shipped by railroad, its importance would seem to be overestimated in this report.

It is also known as a nonshipping seam along Pigeon and Ten-Mile creeks, in Pennsylvania. The fact that coal operators in that locality prefer to sink shafts to the gaseous Pittsburgh seam lying 400 ft. below, however, does not speak well for the quality of the Waynesburg coal. Though generally persistent over large areas, the thickness of the seam is very variable, being only 13 in. in Lewis and Gilmer Counties in West Virginia, while it attains a thickness of 7 or 8 ft. in Greene County, in Pennsylvania. In places the coal has a slaty appearance, and the seam generally has numerous partings of shale, slate and clay, which are difficult of separation in mining and increase the percentage of ash when the coal is burned.

For the purpose of coking, the Waynesburg coal is a poor product, owing to the high percentage of sulphur and ash it contains. These constituents also render it a poor steam coal. The sulphur in the coal would corrode the grate bars, besides forming with the ash hard clinkers that would be difficult to remove.

The extraction of the coal in the Pittsburgh seam, 400 ft. below, would not affect mining in the Waynesburg seam unfavorably, but the workings in the lower seam would rather prove an advantage by the drainage thus afforded in the overlying strata.

# Examination Questions

## Miscellaneous Questions

*(Answered by Request)*

*Ques.*—If the collar beams on the main entry of a mine are 8 in. in diameter, where the width of the entry is 10 ft.: (a) What should be the diameter of the collar beams in the same mine on the turnouts where the width of the entry is 14 ft.? (b) What should be the diameter of the collars on the cross-entries, in the same mine, where the width of the entry is only 8 ft.?

*Ans.*—(a) For round timber, the total load resting on the timber varies as the cube of its diameter and inversely as the length of span. Hence, the load per unit length, or the load corresponding to the roof pressure in a mine, varies directly as the cube of the diameter of the collar and inversely as the square of the length of the span. But the unit load or roof pressure being constant or the same for all the entries, the cube of the diameter of the collar varies as the square of the length of the span. In other words, the cube of the diameter ratio is equal to the square of the length ratio. Or, calling the required diameter of the collar $x$, we have for the turnouts

$$\left(\frac{x}{8}\right)^3 = \left(\frac{14}{10}\right)^2; \text{ or } x = 8\sqrt[3]{1.4^2} = 10 \textit{ in.}$$

(b) In like manner, for the cross-entries having a width of 8 ft., we have

$$\left(\frac{x}{8}\right)^3 = \left(\frac{8}{10}\right)^2; \text{ or } x = 8\sqrt[3]{0.8^2} = \textit{say } 7 \textit{ in.}$$

*Ques.*—(a) Find the approximate m.e.p. in the cylinder of a steam engine that cuts off steam at ⅝ stroke when the boiler pressure, as indicated by the steam gage, is 100 lb. per sq.in. (b) If the diameter of the steam cylinder is 10 in. and the length of stroke 18 in., what is the horsepower developed when the engine is running at a speed of 180 r.p.m.?

*Ans.*—(a) For sea level, the absolute pressure corresponding to 100 lb. gage is 100 + 14.7 = 114.7 lb. per sq.in. This must be multiplied by a constant, 0.904, corresponding to a ⅝ cutoff and an assumed back pressure of 17 lb. per sq.in. deducted from the product, and the remainder then multiplied by an empirical factor, 0.9, according to the formula

$$M.e.p. = 0.9\ (0.904 \times 114.7 - 17) = 78 \textit{ lb. per sq.in.}$$

(b) The length of a double stroke corresponding to a single revolution of this engine being 2 × 18 = 36 in., or 3 ft., the horsepower developed in the cylinder is

$$H = \frac{78(0.7854 \times 10^2)3 \times 180}{33{,}000} = \textit{say } 100 \textit{ hp.}$$

*Ques.*—(a) What is the weight of coal underlying an 80-acre tract of land if the thickness of the seam is 5 ft. 6 in. and its inclination 22 deg., the specific gravity of the coal being 1.32? (b) In American practice, what would be the estimated tonnage of coal per acre that could be mined from this seam?

*Ans.*—(a) There are 43,560 sq.ft. in an acre, and taking the weight of water as 62.5 lb. per cu.ft., the cosine of 22 deg. being 0.92718, the weight of coal underlying this tract is

$$\frac{80(43{,}560 \times 5\tfrac{1}{2})62.5 \times 1.32}{0.92718 \times 2{,}000} = \textit{say } 852{,}700 \textit{ short tons}$$

(b) The estimated tonnage of coal that can be mined from this tract will depend largely on local conditions and practice. In some mining districts an extraction of 90 per cent, and occasionally 95 per cent., of the entire seam is claimed, while in other districts, owing to the friable nature of the coal and numerous geological and physical conditions, the extraction does not exceed 75 or 80 per cent. of the seam. However, it is fair to estimate on an extraction of 90 per cent. under normal working conditions and good management, which gives for the estimated tonnage in this case 0.90 × 852,700 = say 767,400 tons.

*Ques.*—In organizing a rescue party after an explosion, what steps would you take and what instructions would you give? Explain fully.

*Ans.*—Act promptly and call for volunteers. Choose from them those that are most experienced and familiar with the mine. At the same time, give orders for the collection of the necessary tools, safety lamps and material, such as timber, canvas, brattice boards, nails, etc., in order that these may be at hand ready for use when required. While the volunteers are being equipped and organized under an experienced leader, examine the ventilating apparatus and observe what is the condition of the mine workings as indicated by the air, smoke and gases discharged from the mine.

Now, divide the rescuers into three parties—one consisting of men equipped with breathing apparatus that will enable them to explore the workings ahead of the air, another party to form a repair gang and assist in rescue work, a third party to supply material that is needed to make the repairs necessary to restore ventilation in the mine and to assist in other ways to expedite the work. Place each of these parties under a competent leader and instruct the men to obey the orders given by the one in charge of their party. Order that no one except those equipped with breathing apparatus shall advance ahead of the air current. Instruct the first party to explore the mine entries, keeping some 100 or 200 yd. in advance of the second party engaged in making such repairs as may be found necessary to conduct the air forward and restore the circulation in the section of the mine to be explored.

In the meantime, messages have been dispatched to secure the necessary medical attendance and to make suitable provision for the care of any survivors of the explosion. As quickly as survivors are found, they should be brought out to fresh air and placed in the care of competent physicians for treatment. In exploring a mine after explosion, use should be made of caged mice or birds for the detection of poisonous gases, chiefly carbon monoxide.

# Coal and Coke News

## Harrisburg, Penn.

From Jan. 1, to June 1, 1916 862 men were killed in the industrial establishments of Pennsylvania. As a result, 537 women were made widows, 1,109 children were orphaned, and 37 dependent parents were deprived of a bread winner. Of the 862 men 315 were unmarried.

Two hundred and ninety of the claims filed as a result of fatal injuries received by workmen have been adjusted. The total compensation awarded is $742,962.75.

This sum will be paid in installments during the coming years and does not include the cost of medical attendance or compensation in non-fatal accidents.

Since the beginning of the year 375 miners have been killed. In almost every case their dependents are entitled to and will receive compensation.

The average award in the 290 cases adjusted was $2,560.90. That in the majority of instances the compensation was badly needed is made evident by the fact that the average weekly wage of the 862 men killed was $14.86, or a total annual payroll of $666,084.64.

More than half of the total number of workers killed were Americans. The division by nationalities is as follows: Americans, 438; Italians, 111; Polish, 92; Slavonians, 65; Austrians, 61; Russians, 40; Hungarians, 19; Swedes, 6; Greeks, 5; Croatians, 5; Assyrians, 4; Bulgarians, 2; French-Canadians, 2; Spaniards, 1.

The majority of the fatalities occurred in the coal mines. The division is: Miners, 375; laborers, 187; iron and steel workers, 157; railroad employees, 119; clerks, 7; firemen, 9; salesmen, 5; civil engineers, 1; policemen, 1; motormen, 1; teachers, 1; carpenters, 1.

During the first five months of the year the total number of compensatable accidents reported to the bureau numbered 26,531. Four thousand compensation agreements have been paid in full and 13,000 have been approved.

In 397 cases there has been a failure to adjust the claims in accident cases, and petitions have been filed by the injured men asking for a hearing before a referee.

### A Woman Separated from Her Husband Is not Entitled to Compensation

The State Workmen's Compensation Board in an opinion rendered on June 1, rules that a woman separated from her husband cannot claim compensation for his death or injury. The decision was rendered in the case of Helen Bryant Boone, of Milford, Del., against the Pennsylvania R.R. Co., the husband having been killed. The referee found that the husband had been supporting the wife and child from November, 1913, until May, 1914. He was killed last January. The referee made an award to the widow and child.

The board finds that the widow voluntarily withdrew from her husband sometime before his death, and reversed the referee in his award to the widow, saying "She maintained an independent status quite incompatible with that dependency contemplated by our act. We hold that under our act the widow's dependency is one of fact and not of law." The award to the minor child was modified.

Chairman Mackey has also given an opinion affirming the decision of Referee Saylor in the case of John Thomas Keats against the Walli Coal Co., in which it was claimed that Keats was not entitled to compensation because he had been dismissed from employment. The man alleges that he understood he was to return to work and was hurt when he resumed his labor.

The Board has also sustained the award of the referee in the case of Francis Polukiewicz, widow of a miner, and decides that an employee who dies of disease caused by injuries sustained while at work, within the meaning of the act, is entitled to the benefits of the compensation law. The victim in this case died of pleurisy shortly after having his chest injured by a fall of roof in the mine.

### PENNSYLVANIA

#### Anthracite

**Hazleton**—The Lehigh Valley Coal Co. has refunded to its employees the tax paid by them on coal used for household purposes since the imposition of the tax law on June 1, 1913, and which was later declared illegal.

After long and faithful service in the mines of A. Pardee & Co., in fact, after being employed since 1839, the mine mule is being banished from the Cranberry and Crystal Ridge collieries. These are being put in shape to use locomotives and power from Harwood.

J. S. Wentz & Co., owner of Hazle Brook and Upper Lehigh collieries in this district, has voluntarily increased the wages of all clerks, foremen, surveyors, and such other employees as do not come under the wage agreement signed with the organized men. The basis of increase is the same as that granted to the miners.

**Wilkes-Barre**—Although no public announcement has yet been made, and while no official denial is made in regard to the matter, it is stated that the Lehigh & Wilkes-Barre Coal Co. contemplates instituting a system of pensions for its old employees. The amount of the pensions it is believed will represent a certain percentage of the wages which the beneficiaries received during the last several years of their service. The pensioning of old employees of mining companies in the anthracite region is a new undertaking, and as far as can be learned the Lehigh & Wilkes-Barre Coal Co. is the first firm to institute it.

**Parsons**—A section of the East End boulevard extending for more than 150 ft. along the road and stretching far back along the sides caved in on May 30, and throughout the night there was danger of automobilists driving their cars into the cave, which was almost 100 ft. deep. Rotting of pillars in the old Delaware & Hudson Co. workings in that vicinity is believed to have been the cause of the cave which will require much time to fill. A steam shovel in use by the Delaware & Hudson Co. in stripping operations was swallowed in the cave.

**Yorktown**—A new auto truck has been put into commission for the Lehigh Valley Coal Co. It is to be used for the transportation of employees at various points in the division. The experiments conducted during the past few months with an auto truck disclosed the practicability of this form of transportation.

**Luzerne**—As the result of a mine cave in the Haddock workings of the Haddock Coal Mining Co., a 30-in. water main burst on May 31, flooding cellars in the town and cutting off the supply of water to the residents of the borough. A large force of men from the mining company and the water company repaired the damage during the night.

**Pittston**—Ten residences on Norman St., Pittston Township, were affected recently by extensive surface subsidence which occurred over the workings of the Butler colliery, Hillside Coal and Iron Co. A squeeze in the surface vein is said to have been the cause. The subsidence was general and the settling so even that the damage was confined to cracks in plaster and foundations and walls being thrown out of plumb. Fissures appeared under the tracks of the D. & H. R.R.

#### Bituminous

**Barry**—The Cambridge Coal Co.'s colliery which has been idle for three weeks undergoing repairs, resumed full operation on June 5 giving employment to several hundred men and boys.

**Punxsutawney**—After having been closed down because of labor troubles for several weeks, the Lucerne mines of the Rochester & Pittsburgh Coal and Iron Co. resumed operations during the week of June 1. More than 2,000 miners returned to work.

**Seward**—The Robindale mine of the Conemaugh Smokeless Coal Co. resumed operations on June 1, after having been closed down for the past two months. This is the mine in which an explosion occurred on Mar. 30, when 8 men lost their lives. More than 100 men were at work. The mine has been much improved and is being illuminated with electricity. The men use only locked safety lamps.

**Osceola Mills**—The power plant of the Weston mines of the Moshannon Coal Mining Co., was destroyed by dynamite on May 30, entailing a loss of over $12,000. One thousand dollars reward is offered for the arrest and conviction of the guilty parties.

**Uniontown**—Injuries from the kick of a mule, which resulted in the death of John Leshefkey last fall, is the basis of a suit against Leshefkey's employer for $20,000 brought by

his 16-year old widow, Mrs. Maude Leshefkey. This man was employed as a miner, but was transferred to the position of driver. The widow alleges that he was furnished with a wild and vicious mule, which kicked him in the stomach, resulting in his death.

**Heilwood**—Two men were killed by a runaway trip at the plant of the Penn Mary Coal Co. recently. These men, together with two others, were riding in an empty car which a locomotive was pushing over a slope. As the crest was passed, the car in which they were riding became detached from the rest of the trip and ran away. The two men jumped from the car and were killed; the other two remained in the car and were uninjured.

**Windber**—The Berwind-White Coal Mining Co. is making extensive improvements on the tipple at Eureka Mine No. 40.

**Wyano**—The Youghiogheny & Ohio Coal Co. suffered a loss of between $5,000 and $6,000 on June 4 about 5 p.m., when the mine foremen offices of mines Nos. 1 and 2, the lamp house and first-aid room, together with 100 Wolf safety lamps, and about 550 Edison electric lamps were consumed by fire. The origin of this fire is assumed to have been crossed electric wires. The record books and first-aid equipment were saved.

**Somerset**—Operation at mine No. 115 of the Consolidation Coal Co., about five miles southeast of Somerset, came to an end recently. Falls inside the mine caused a heavy squeeze on the stumps, and everything settled down to about 2½ ft. Further operations were consequently impossible.

**Ridgway**—After having been on strike for two weeks, the 900 coal miners employed by the Northwestern Mining and Exchange Co. at Dagus mines, recently resumed work, the difficulties having been adjusted.

**Connellsville**—The coke output of the Connellsville district recently amounted to 437,000 tons per week against 434,000 tons during the previous week. Merchant operators shipped approximately 30,000 tons of coal during the same time, coal and coke shipments from the region totalling 617,000 tons.

**Patton**—A mine rescue car of the U. S. Bureau of Mines, in charge of J. B. Berry, is now located at Patton. After June 17 this car will be stationed at St. Benedict, while two weeks later it will be sent to Barnesboro.

**Charleroi**—Manufacturers throughout the Monongahela Valley are fearing a coal famine, as there already exists a need of fuel. Their apprehension is due to the coal strikes because of dissatisfaction over the wage scale.

### WEST VIRGINIA

**Davis**—The Davis Coal and Coke Co. is now operating its new mine No. 29. The first load of coal was moved over the connecting road several days ago, and the mine is turning out a good tonnage. The operators claim quite a record in having located, graded tracks, and built a tipple, as well as 1¼ miles of tramroad in 31 days. It is expected that another mine will be opened soon, bringing the daily output of both operations up to approximately 1,500 tons per day by Sept. 1. A third mine may be opened later.

**Charleston**—The Logan Mining Co. has contracted with the Diamond Construction Co. for the erection of ten dwelling houses at Earling, for five at Mona, and expects to contract for 20 additional houses at Rossmore.

**Kimball**—Four men were killed recently in an explosion in the mine of the Houston Collieries Co. between Vivian and Kimball. All the victims were miners, two being Spaniards, and two negroes. About 100 men were at work in the mine at the time of the accident, but all escaped without injury, except the four who were killed. The explosion was said to have been entirely local, and no serious damage was done to the mine. Less than two hours after it occurred, the débris was cleared away and an investigation into the cause of the accident had been begun.

**Logan**—The Chesapeake & Ohio R.R. is at work on plans for reducing grades on the Guyan Valley division, and it is said that it will double track as far as Barboursville. The capacity of this division is inadequate to handle the coal tonnage which it receives.

### ALABAMA

**Birmingham**—Business in the coal circles of the Birmingham district has taken on new life. Negotiations have just been closed that call for delivery within the next two years of about 3,250,000 tons of coal from this district. Most of the coal is to be taken by the railroads. The Tennessee Coal and Iron Co. will deliver to Pensacola 20,000 tons for the Government and the De Bardeleben Co. has also received a handsome order from the Government. Thirteen hundred sacks of coke manufactured at New Castle, Ala., is being rushed to New Orleans bound for Chile.

### TENNESSEE

**Chattanooga**—The Durham Coal and Iron Co.'s tipple and washery at the Soddy coal mines near Chattanooga was destroyed by fire of unknown origin recently. The loss is estimated at $100,000, partially covered by insurance. Five hundred miners will be out of regular work for several days. Destruction of the washery included an electric-light plant which served the town.

### KENTUCKY

**Lexington**—Thirty-three applicants recently took examinations before the state board here for certificates as mine foremen.

**Nelson**—A case of violence attributed to the western Kentucky labor situation occurred here when the commissary of the Nelson Creek Coal Co. was shattered by dynamiting on the morning of May 31. Sam Maple, clerk in the store, which also contained the post office, was asleep in the building but was not injured. This was one of the mining companies whose employees struck and as a consequence the commissary was closed and the former employees refused credit. Robert Pollock, president of the union, immediately put bloodhounds on the trail of the culprit, whose action he states is in violation of the purposes of the union. He presumes that it was an individual effort to damage the company and does not believe that the explosive was placed by union miners.

**Central City**—Thirteen mines, employing more than 1,000 of the 5,200 men recently locked out by the western Kentucky coal operators are reported running at full capacity. These mines are the Central City, Advance and Woodson mines in Muhlenberg County; De Koven, Uniontown, Waverly, Baskett, two Morganfield, two Henderson and two Island Station mines.

**Hazard**—The 15th plant in the Hazard coal-mining field has been started on Buckeye Creek, near Hamdin, by the Kenmont Coal Co., composed of C. A. Case and L. K. Brown, of Zanesville, Ohio; Lee Miller, of Toledo, Ohio, and W. E. Davis and H. E. Bullock, of Hazard. J. B. Allen is in charge of the work of installation.

### OHIO

**Congo**—Mine No. 302 of the Continental Coal Co., near this place, has been placed in operation again after an idleness of nearly a year. The mine was formerly owned and operated by the Sunday Creek Coal Co. About 400 men will be employed.

**McArthur**—Miners employed at Mine No. 11 of the Superior Colliery Co., one of the largest mines in Jackson County, struck recently to enforce their demand for an advance in pay for handling machine cuttings. The company has announced that unless the trouble is settled shortly it will abandon the mine.

**Martins Ferry**—Eight holidays and all Sundays are recognized as legal holidays for the miners of eastern Ohio. The holidays are New Years, Washington's Birthday, Apr. 1, Memorial Day, Fourth of July, Labor Day, Thanksgiving and Christmas. The eight-hour day is construed as meaning eight hours of actual work in the mine.

**Hopedale**—The Hopedale Coal Co. has started stripping coal with a Model 300 Marion steam shovel, on the Wabash-Pittsburgh Terminal R.R. H. B. Salkeld is secretary-treasurer and manager of the company, with offices in the Henry W. Oliver Bldg., of Pittsburgh, Penn.

### INDIANA

**Oakland City**—The Ayrshire Coal Co. is making preparations to abandon Ayreshire mine No. 5, one of the largest mines in the Ayreshire group. The firm will reopen mine No. 4 and start work on a new mine, to be known as No. 8.

### ILLINOIS

**Springfield**—The following men have passed examinations for mine managers of the first class before the State Board of Mine Examiners: Frank J. Esper, Riverton; Barney Murphy, Pana; George Eadie, Nokomis; Thomas R. Davis, Kewanee; Alexander Gray, Staunton; John Lobenot, Collinsville; Henry Graber, Mapleton; Emanuel Hickman, Belleville; Robert Baster, Canton; J. R. Priett, Clifford; Clinton Richardson, Virden, John Senger, Springfield; Joseph Blank, Peoria; Samuel Deacon, Eldorado; Patrick Hoban, Springfield, Patrick Flood, Spring Valley; Robert A. Frew, Gillespie.

**Belleville**—The case against Clint Ogles, charged with setting fire to the fanhouse of a mine at Marissa, Ill., with in-

tent to burn it, was taken from the jury by Circuit Judge Crow at the end of the state's case. The Judge stated that the evidence indicated that Ogles had actually burned the building, instead of merely setting fire to it with intent to burn it, as the indictment charged. Judge Crow held that the indictment should have been drawn under the arson section of the criminal code.

**Spaulding**—Sinking of the earth over the Spaulding mine is causing anxiety among residents here for the safety of their homes and has caused the Illinois Central R.R. to reduce the speed of all trains to five miles per hour in passing through Spaulding. There is a depression 50 ft. across and 5 ft. deep surrounding the old shaft of the mine. The depressed area is near the railroad tracks. Rumblings in the interior of the mine indicate displacement of heavy masses of coal and dirt The mine is not being operated.

**Kincaid**—The Peabody Coal Syndicate has been obtaining options along the Midland R.R. between here and Taylorville with a view to the erection of a plant for the manufacture of mine powder. Representatives of the company have been securing the consent of property owners adjoining the proposed factory site. The site is just north of Calloway's crossing and abuts on the railroad. The factory building will be half a mile from the railroad and an equal distance from any wagon road. It is expected that an industrial village will spring up around the plant, as a large number of hands will be employed. The location is only a short distance from the company's big power plant.

**Shiloh**—With his left arm wedged between the cage and the wall of the shaft of the Shiloh mine of the Southern Coal, Coke and Mining Co., James Mooney was suspended three hours some days ago while carpenters, after building a scaffold, loosened bolts and cut away timbers to release him. Mooney had pushed a pit car on the cage and was placing the latch bar when the cage was hoisted. His arm caught between the cage and the wall and he was drawn up 20 ft., when the cage jammed and stopped. He was held with head and shoulders against the bottom of the cage and his legs dangling. When released it was found that no bones had been broken.

### IOWA

**Des Moines**—The Ray Coal Co. has abandoned mining operations. It was impossible to pay the scale of wages for miners and make a profit, according to President Thomas A. Ray. The company has leased an entire block in this city and will erect a coal yard.

## PERSONALS

**M. F. Peltier,** of Chicago, has resigned his position as chief engineer of the Peabody Coal Co. on account of poor health.

**Angus W. Louther** has been appointed district superintendent of Consolidation Mines Nos. 118 and 119, Pennsylvania Division. Mr. Louther's address will be Jenner, Penn.

**S. E. Miller** has been appointed real estate agent of all the property of the Lehigh Coal and Navigation Co., succeeding John C. Losier resigned. Mr. Miller's headquarters will be at Mauch Chunk.

**Charles J. Groff,** recently accepted a position with the Susquehanna Coal Co. as assistant to the General Superintendent, William Auman, who has charge of several collieries at Shamokin and Mt. Carmel, Penn.

**P. C. Royce,** who was an erecting engineer for the Marion Steam Shovel Co. for a number of years has been made general superintendent of the stripping operation of the Piney Fork Coal Co. in Jefferson County, Ohio.

**Charles Whetzel,** who has been employed at Boswell, Penn., by the United and Merchant Coal companies, since 1903, has accepted employment with the United Coal Co. at Jerome, and has already entered upon his new duties.

**R. G. Harris** recently became attached to the selling force of W. H. Bradford & Co. coal operators, with main offices in the Commercial Trust Building, Philadelphia, Penn. Mr. Harris for many years was connected with Cortright & Co.

**E. B. Thomas,** it is reported in financial circles, may soon retire from the presidency of the Lehigh Valley R.R., and be succeeded by a younger man. Mr. Thomas is past 70 years of age, the limit at which the officers and employees of some roads are required to retire.

**Frank Farrington,** president of the United Mine Workers of Illinois, announces that from reports he has received from all over the state he is convinced that summer conditions in the mining industry will be better than usual, after the oversupply of coal has been used up.

**John Conway and James Hodgert,** superintendent and inside foreman, respectively, at the Dark Water colliery of Thorne & Meal near Pottsville, have resigned. Both men have been in the employ of the company for many years and now desire to retire from active service.

**G. M. Shoemaker,** manager of the coal department of the La Follette Coal and Iron Co., of La Follette, Tenn., recently returned from Duluth, Minn., and Superior, Wis., where he inspected a large shipment of his company's "Rex" coal. This fuel has proven itself to be an excellent coal for Lake trade.

**H. J. McQuade,** of New York City, who has served for some time as the secretary-treasurer of the Lehigh Valley Coal Co., has resigned that position. The vacancy has been filled by the election of F. H. Sullivan, who will also be in charge of the purchasing department of the company, with offices in New York.

**E. R. Pettebone,** of Dorranceton, Penn., superintendent of the Delaware & Hudson coal department, has been relieved of that position and will become consulting mining engineer for the same company. Cadwallader Evans, Jr., who has been assistant to the superintendent becomes superintendent to succeed Mr. Pettebone.

**John H. Fulford,** who has been superintendent of the Northwestern Mining and Exchange Co.'s operations in western Pennsylvania since the death of the late Joseph Bailey eight years ago, recently tendered his resignation and retired from the active head of the company in that district. He has been succeeded by C. H. Richardson.

**J. W. Peck,** manager of the Wichita branch of the Western Newspaper Union, has resigned his position to go to Denver, Colo., where he will take up work as general manager of the American Coal Refining Co. Mr. Peck has been with the Western Newspaper Union since 1909. He is much interested in the refining company, being a large stockholder.

**Prof. C. J. Norwood,** a state mine inspector and dean of the College of Mines and Metallurgy at Lexington, Ky., has been appointed superintendent of the minerals and forestry departments of the Kentucky State Fair at Louisville. He has asked that all who are eligible as exhibitors coöperate with him to make the list of exhibitions as extensive as possible.

**James Goldsworthy,** of Audenried, Penn., has been appointed superintendent of the Sugar Notch, Maxwell, and Wanamie collieries of the Lehigh & Wilkes-Barre Coal Co., with offices at Wilkes-Barre. Mr. Goldsworthy was formerly inside superintendent of the Honey Brook division of the above firm in which position he is now succeeded by Daniel Sube, foreman at Honey Brook.

**V. R. Delamater** recently became fuel engineer in charge of coal washing for the Pennsylvania Steel Co., with main offices at Steelton, Penn. Mr. Delamater will not only have charge of the coal washing, but will have supervision of the coal stock including coking, bituminous, gas, slack and anthracite coal, coke breeze and the disposition of these products in the various departments, the sampling of coal, the deliveries of gas, tar, coke and coke breeze and miscellaneous matters between the various operating departments, and the Semet-Solvay Co.

## OBITUARY

**C. Herbert Sternberger,** prominently identified with the coal interests of Ohio, particularly with those of Jackson County, where he was born and entered the coal-mining business with his father and brothers, died recently at his home on Robinwood Ave., Toledo, after a three-months' illness. He was aged 51 years and had been a resident of Toledo for 13 years. He was a recognized factor in the coal trade in Toledo, as well as in Jackson County.

**Charles Edward Borden,** who was well known to the coal trade of New York and vicinity, died at his home in Summit, N. J., on May 30, after several months illness. He was 37 years old and is survived by a brother and sister. "Ed.," as he was affectionately known, entered the coal business under the late Daniel F. Connor, in the office of Whitney & Kemmerer. During the last few years he had been connected with Percy Heilner & Son and later with Pattison & Bowns. The funeral which was held on Friday, June 2, was attended by many coal men.

# INDUSTRIAL NEWS

**New York, N. Y.**—The Goldschmidt-Thermit Co. recently announced the removal of its general offices to the Equitable Bldg., 120 Broadway, New York City.

**Philadelphia, Penn.**—Since the retail price of anthracite has been increased by local dealers, manufacturers of byproduct coke have become particularly active in this market, and are using aggressive methods to popularize their product.

**Greensburg, Penn.**—For his services during the last two weeks of May, Mike Klingo, a miner employed at Jamison No. 2 mine received $102.60. James Amich, another miner employed at the same plant, received $92 for his two weeks' work.

**Philadelphia, Penn.**—Manufacturers of house-heating apparatus report receiving numerous inquiries from householders considering the advisability of changing the grates in their furnaces to accommodate the smaller sizes of anthracite in view of the recent increase in prices.

**Philadelphia, Penn.**—Over 150 members of the Coal Club of Philadelphia took part in the outdoor celebration of the organization at Mohican Park, on the Delaware River. Various sports were indulged in, including a baseball game, and the festivities were brought to a close with a shad dinner.

**Columbus, Ohio**—The George M. Jones Coal Co., of Toledo, is preparing to open a sales office in Columbus, which will be under the charge of Fred Watson. Since the George M. Jones interests have taken over the Continental Coal Co.'s property and the output is increased the need for a Columbus sales office was apparent.

**Columbus, Ohio**—The announcement is made by the officials of the Maynard Coal Co., of Columbus, that the new modern steel tipple on the company's property at Hazard, Ky., operated under the name of the Daniel Boone Coal Co. has been completed. The tipple connects two mountain slopes and permits of loading from both sides.

**North Fork, W. Va.**—A government inspector accompanied by William Beals, Eastern sales agent of the Crozer-Pocahontas Co., was recently in this field making preparations to ship 100 carloads of Pocahontas coal by rail to the Pacific Coast for use of the United States Government. This coal was purchased through the Crozer-Pocahontas Co.

**Scranton, Penn.**—A new wage scale for driver bosses, firebosses, foremen and assistant foremen has been advanced by officials of the Delaware & Hudson Co. Becoming effective June 1, the monthly pay for these employees will be as follows: Foreman, $125 to $150; assistant foremen, $95 to $115; firebosses, $90 to $105; driver bosses, $80 to $95.

**Salt Lake City, Utah**—Eastern fuel men are inspecting the mines of a number of companies in Emery and Carbon Counties with a view to purchasing the properties which are in the control of firms now operating in Salt Lake. For some time it has been reported that Eastern capitalists have been figuring on taking over the controlling interest in a number of mines in the Utah coal section.

**New York, N. Y.**—A. H. Smith, president of the New York Central Lines and chairman of the executive committee of the Eastern Freight Accumulation Conference, has announced that the organization will discontinue its work and be dissolved. This step is taken because of the material improvement in the freight situation, as affecting the Eastern railroads, which it was established to regulate and observe as regards the question of embargoes.

**Louisville, Ky.**—Kentucky operators have been much interested in the order of the Interstate Commerce Commission ordering revision of freight rates on bituminous coal from Mines in Kentucky, Illinois and Alabama to points in Alabama, Mississippi, Tennessee and Louisiana, effective Aug. 1. The result, which lowers rates from Alabama and increases rates from the other states to the same points, will be, it is declared, to place the three states on a competitive basis.

**St. Louis, Mo.**—E. J. Wallace, St. Louis agent of the Chicago-Carterville Coal Co., has filed suit in the Circuit Court against the Hooven-Owens-Rentchler Co., of Hamilton, Ohio, for $14,767, alleging breach of contract. Mr. Wallace was formerly St. Louis agent for the Dealers' Fuel Co., of Nashville, Tenn. He gave up that connection to act as the agent of the Hooven-Owens-Rentchler Co. at Cleveland, Ohio, under a contract guaranteeing him $10,000 a year. The breach of contract alleged is failure of the company to supply him with goods.

**Boston, Mass.**—The New England Coal and Coke Co. has chartered its steamer "Melrose" to the United States & Brazil Steamship Co. for one trip to the River Platte with general cargo. The rate received by the owners for this trip is said to be $92,000 per month, the same rate which the United States & Brazil Steamship Co. paid for a similar voyage of the steamer "Newton," also owned by the New England Coal and Coke Co. The "Melrose" will be out of the coal trade about three months.

**Cincinnati, Ohio**—In the suit of the Marmet Coal and Mining Co. against the dredge "Northern No. 2," owned by the Fieger-Austin Dredging Co., of Pittsburgh, growing out of a collision between the dredge and the coal company's loaded coal barges in September, 1914, the United States District Court has held that both parties were at fault and that damages and costs should be equally apportioned between them. The Marmet company sued for damages of $2,800, while the dredging company made a counterclaim of $5,500.

**Washington, D. C.**—The Interstate Commerce Commission has denied a rehearing to the railroad companies in the matter of reduced rates ordered by the commission on shipments of anthracite coal from the Wyoming, Schuylkill and Lehigh regions to tidewater points in northern New Jersey. These rates became effective in the forepart of last April, and made a considerable reduction in the prepared size and pea coal rates, although the steam sizes were slightly increased. It is now expected that the commission will soon dispose of the question of new rates which it ordered about the same time for tidewater shipments at Philadelphia, but which have not as yet become effective.

**Philadelphia, Penn.**—Luxurious fittings and fine tapestries and upholstery on the new Mexican steamship "Coahuila," intended to attract select passenger travel, did not prevent her owners from placing the vessel in the coal trade between Philadelphia and Cuba, to reap the advantages of the present high freight rates. In command of Captain Hormaza, this vessel cleared Philadelphia on June 3 on her maiden voyage for Cienfuegos, Cuba, with a cargo of coal and coke. It is said that vessels of the "Coahuila's" type are the finest craft ever built for the Mexican trade. They are 317 ft. long, 45 ft. beam and 22.8 ft. deep, and were intended to carry passengers between New York and Vera Cruz, Mexico.

**Columbus, Ohio**—The Central Ohio Coal Operators' Association, which has a membership of ten companies, and six individual operators, has filed with the Ohio Public Utilities Commission intervening petitions in the case in which the Pittsburg Vein Operators' Association and the Cambria Mining Co. are asking for lower coal rates in eastern Ohio. The companies intervening take the ground that if the rates in the territory embraced by the Pittsburgh Vein Association are lowered, the rates in their territory should be lowered proportionately. They admit that their rates are 5 to 26c. lower than those prevailing in Belmont, Jefferson and Harrison Counties, but assert that they are entitled to a lower rate on account of existing conditions, including more expensive mining conditions, inferior coal and a limited market.

**Scranton, Penn.**—Over $100,000,000 worth of property is involved in the 31 appeals filed by the Delaware, Lackawanna & Western R.R. Co.'s coal department to the assessment and valuation of coal lands made by the board of county assessors for this year. The appeals were filed by Ex-Judge B. R. Jones and D. R. Reese and cover all the coal property of the railroad company located in Luzerne County. The appeals set forth that the valuation placed on the coal property is excessive and much greater than it would command at public sale, that it is grossly excessive as compared with the valuation placed on other property in the county and the quantities assessed are greater than the actual amount of mineable coal; further, that the method of assessment is illegal through the applying of a blanket rate for the coal values instead of assessing each individual tract separately.

**Columbus, Ohio**—The Hocking Valley Railway Co. has withdrawn its new coal-rate schedule, filed with the Ohio Utilities Commission several weeks ago, increasing the rate from the Nelsonville assembling yards to Toledo from 85c. to $1. This was the second attempt on the part of the railroad company to increase the rate for lake shipments. The first schedule was withdrawn before any evidence upholding the reasonableness of the new rate was filed and the second schedule had the same fate. Just before the time limit for presenting evidence expired the new schedule was withdrawn. In the meantime the Ohio Utilities Commission is considering the evidence in the long-drawn-out freight rate case started by the miners' organization and later taken up by the Sunday Creek Coal Co. All of the evidence has been adduced and a decision is expected soon. The action seeks to still further reduce the rates on coal shipments in Ohio.

# Market Department

## General Review

**Anthracite market steady. Pittsburgh district labor difficulties cause a sharp flurry in seaboard market. Demand continues persistent. Middle Western mine operations heavily restricted but prices steady.**

**Anthracite**—The current market is somewhat steadier than is usually the case at this season, due to the curtailed production as a result of petty labor disturbances throughout the mining regions. There are sufficient orders to absorb the output at the moment, but buyers of storage coal generally expect to be able to fill their requirements at the current figures any time during the next 60 to 90 days, and are showing a disposition to hold off in hopes of a possible break in the meantime. Pea coal and No. 1 buckwheat seem particularly liable to attack by the price cutters. Operators are making active efforts to close contracts, while consumers are inclined to hold off, particularly the large buyers, a number of whom are entering into negotiations with bituminous interests, with a view to changing their fuel. The market at down East points is firm and steady, and it will necessitate an appreciably heavier movement in that direction to seriously affect the situation. Evidence of the delayed movement of anthracite is seen in the heavy decline in Lake shipments as compared with last year.

**Bituminous**—The Pittsburgh labor difficulties have caused a distinct flurry, some of the large steel interests having now bought up the output of a number of mines shipping the seaboard market. Substantial increases in spot prices on the grades affected has been the result, while it is expected that other varieties will act in sympathy with these, should the trouble be long continued. In addition to this the shortage of labor seems to become more pronounced as the season advances and there are no indications of any relief in this direction. However there is considerable accumulation at some of the Seaboard ports, although it is a significant fact that weekly shipments from Hampton Roads continue very close to the record figures. A slight reaction in ocean freights has occurred which has been very gratifying to shippers, but rates are still too high to make a free movement possible, and shipments are held down rigidly to exact requirements.

**Lake Trade**—The tension which has characterized the Pittsburgh district market was materially relieved the early part of the current week when tentative arrangements were concluded for resuming operations in at least a portion of the mines and it was announced that the national officials of the miners' union would convene on Monday and make a determined effort to effect a permanent settlement for the whole district. Previous to this the market was very sensitive to the varying aspects of the labor outlook, though the possibility of a runaway market was no longer a consideration, due to an apparently unlimited supply of West Virginia coal. The spot market is now practically at a standstill, pending further developments, and the movement is confined entirely to contracts. Demand from all sources including general manufacturing, Lake and railroad coal, continues steady, with prices well maintained.

**Middlewest**—The market is quiet particularly as regards domestic grades, but prices are well sustained. Operations are heavily restricted and are being held very close to consumptive requirements so that the amount of consignment coal standing unsold is relatively small. This coöperation among the leading interests to restrict the surplus coal on the market down to a minimum is meeting with unexpectedly gratifying results. Only a few producers, including a number of the coöperative mines, which are usually forced to work under any conditions, are accepting business at the current figures ruling in the spot market. In the meantime, the future outlook continues as promising as ever. An active demand for threshing coal has set in while reports from the Northwest all tend to indicate an active business from that direction for the Middlewestern coals.

**A Year Ago**—The anthracite tonnage suffers a sharp decline and prices are weak. Bituminous exports are approximately double but situation still unsatisfactory. Outlook more encouraging but hesitating over the crisis in diplomatic circles.

## Business Opinions

**Iron Age**—The tendency of prices for early delivery to approach those for forward delivery is more marked in the heavier finished lines—particularly in bars and structural shapes and to a less degree in plates. In that feature of the market close observers are confirmed in the judgment recently passed that in prices the crest of the wave has been seen. Taking pig iron as the measure, May was a month of high-rate production, the total being 3,351,073 tons, or 108,099 tons a day, against 3,227,768 tons in April, or 107,592 tons a day, and 107,667 tons a day in March, the previous high rate. With 321 furnaces in blast June 1 the capacity active was 108,386 tons a day against 109,072 tons a day for 322 furnaces at the begining of May.

**Building Operations**—Permits taken out for new building during May reflect a large increase in projected construction not only over last year, but as compared with both 1914 and 1913, the total according to the statement prepared by Dun's Review, which includes returns from the building departments of 73 leading cities, calling for the expenditure of $87,352,814, as against $69,974,342, an increase over the same month last year of no less than 32.7 per cent.

**American Wool and Cotton Reporter**—Although there is every indication of a boom market in Boston, the trade is in general awaiting definite information from London as to how long the embargo on merino wools from Australia is liable to continue. Dealers are also interested in the political situation in this country. Representatives of Boston wool houses, when the embargo was declared, at once paid the Western wool growers their prices, and Boston dealers in turn advanced their prices. The worsted mills are hard pressed for material, they are consuming wool so fast, but the woolen mills have more supplies on hand and available in the market.

**Dun**—Augmented activity characterizes mercantile operations as the weather improves, retail trade reflecting enlargement in nearly all sections and branches. Evidences of restricted distribution because of the high costs are comparatively rare, while in many instances the strengthened financial position of consumers is indicated by the pronounced preference for the better grades of merchandise. Except in respect to the shortage and unrest of labor, manufacturing conditions could hardly be better and relatively little suspension of work in the leading industries is anticipated this summer. Commercial failures this week in the United States, are 292 against 314 last week, 348 the preceding week and 348 the corresponding week last year.

**Bradstreet**—Feverish buying has subsided, but in its place has come a steady, more orderly and yet very large volume of business, and the virtual arrival of the between-seasons period sees trade as well as industry moving along at a rate far above the seasonal, normal. Neither the reduced domestic buying of steel nor the weakness in southern pig iron, old materials and such metals as copper, spelter, lead, tin and antimony loom large in an otherwise strong situation. Optimism, though tempered by high prices, is not one whit less marked than it was at the height of the boom, the plain fact being that the country is sold up and therefore can afford to sit back for a breathing spell.

**Dry Goods Economist**—The indications are that retailers will endeavor to prolong the current season as much as possible. Most stores now have on hand liberal stocks of spring and summer merchandise, and amid present market conditions it is desirable, and still feasible, to push out large quantities of such goods at a reasonable profit. In most instances, goods which were purchased three months ago could be replaced today only at higher figures. Moreover, both the raw material and the labor situation indicate the maintenance, if not the enhancement, of present values.

**Marshall Field & Co.**—Current wholesale distribution of dry goods shows an increase over the corresponding period of a year ago. Road sales for immediate delivery show good gains over last year. Buyers have attended the market in much larger numbers. Collections show an improvement over the corresponding week last year. Prices on domestic cotton goods are strong.

# ATLANTIC SEABOARD

## BOSTON

**Coastwise movement closely confined to contracts and a very light demand for spot coal. Georges Creek in better supply and Pennsylvania grades continue easy. Anthracite trade in good shape.**

**Bituminous**—So far as the demand for spot coal is concerned Pocahontas and New River are settling down into a normal summer market. Accumulations are still large at the Hampton Roads piers, and practically the only movement coastwise is in season contracts. The coal factors are not shipping more than they are under obligation to unless the buyer furnishes the bottoms. F.o.b. prices are the same as a week ago but the volume of business is still curtailed by the high range of marine freights. The prospect for a better supply of water transportation is not very bright at this writing. Except for the fact that so large a proportion of New England business for 1916-17 was closed last October before rates had materially advanced these would be very interesting times for coal shippers. As it is, there is a good deal of apprehension over possible conditions next fall.

Meanwhile, the trade inland from the various distributing points is dull and lifeless. Cargoes on what should be a reasonable basis, water freights considered, go hard at this end and buyers take coal on present prices very sparingly. A few large consumers are making it a point to keep their stocks larger than usual for the season, but it is difficult getting forward anything in excess of contract stipulations.

Georges Creek supply has somewhat improved. On the part of shippers there are fewer purchases of Hampton Roads coal to substitute on contracts and the movement of fleet units is better. There is a fair volume of this grade available at Philadelphia and New York loading piers, but so far this has been closely confined to requisitions on contract.

The market for Pennsylvania grades is generally quiet. Most shippers are now reconciled to a range of prices somewhat lower than anticipated. The uncertainties incident to Tidewater loading make operators more than commonly interested in shipments all-rail in order to keep up their output.

**Anthracite**—Domestic sizes are all in good request. Practically every shipper of any size is well supplied with orders not only for June but for July and August as well. The volume of hard coal coming to this market by water will have to show a very marked increase in order to affect the current demand. It is expected in most quarters that there will be a good firm demand throughout the summer. Moreover, the public seems impressed as never before with the argument that coal may be scarce later.

The anthracite situation in this territory is so much involved with the kind of movement dealers get all-rail and the effect of weather on the supply of barges at Tidewater that it is hard to predict at this stage whether there will be difficulties in getting coal forward next fall and winter. Several prominent members of the trade feel that there is trouble in store for them.

Bituminous at wholesale, f.o.b. loading ports at points designated, is quoted about as follows:

| | Philadelphia | New York | Baltimore | F.o.b. Mine |
|---|---|---|---|---|
| Clearfields | $2.25@2.80 | $2.60@3.10 | ..... | $1.00@1.55 |
| Cambrias and Somersets. | 2.55@3.00 | 2.85@3.25 | ..... | 1.30@1.75 |
| Georges Creek (contract) | 3.07@3.17 | 3.37@3.47 | $3.00@3.10 | $2.00@2.10 |

Pocahontas and New River are $2.70@2.80, f.o.b. Norfolk and Newport News, Va., and $4.85@5 on cars at Providence and Boston.

## NEW YORK

**Anthracite demand slow but prices well maintained. Labor troubles curtail production. Bituminous shows no activity. New England shipments heavy.**

**Anthracite**—That the price of anthracite at Tidewater is being generally maintained is attributed largely to the curtailed production due to the many petty labor disturbances in the mining regions. As it is, supplies while sufficient to meet all demands, are not over-abundant and prices, except in a few isolated cases, are held firm. The only size causing any trouble is chestnut and an occasional lot of this has sold at from 10 to 15c. off company circular. Concessions of 10c. are noted on the other prepared coals including pea, but they are the exception.

The steam coal situation remains unsettled. There is no large quantity on hand but some cutting of prices is noted. Boiler coal is not giving the satisfaction expected and the demand is slow. Some lots of buckwheat No. 1 were quoted at from 20 to 30c. off circular, according to quality. Several large contracts for this grade which are ordinarily closed in April are still open.

Current quotations, per gross ton, f.o.b. tidewater, at the lower ports are as follows:

| | Circular | Individual | | Circular | Individual |
|---|---|---|---|---|---|
| Broken | $4.95 | ..... | Pea | $3.50 | $3.40@3.50 |
| Egg | 5.15 | $5.05@5.15 | Buck | 2.75 | 2.25@2.75 |
| Stove | 5.40 | 5.30@5.40 | Rice | 2.25 | 2.20@2.25 |
| Nut | 5.45 | 5.30@5.45 | Barley | 1.75 | 1.65@1.75 |
| | | | Boiler | 2.20 | |

Quotations at the upper ports are generally 5c. higher on account of the difference in water freight rates.

**Bituminous**—There is no activity in the bituminous market. Buying is quiet and everybody seems to be playing a waiting game. There is considerable optimism, however, and some shippers look for better business after a few weeks. There is a good call from New England coast towns and shipments are heavy in that direction.

Production is no where near normal due to labor shortage which is becoming more pronounced each day and some operators also complain of car shortage. These two conditions have no doubt kept prices where they are and prevented a slump in the market. Contract coals are moving freely but the shipper with free coal is having difficulty in placing it. Prices for good grades are firm at from $2.65 to $2.75. A couple of stray cargoes were reported as having been picked up at one of the lower ports early this week at $2.50.

Current quotations, f.o.b., gross tons, Tidewater for various grades follow:

| | South Amboy | Port Reading | St. George | Mine Price |
|---|---|---|---|---|
| Georges Creek Big Vein | $3.50@3.80 | $3.50@3.80 | $3.50@3.80 | $1.95@2.25 |
| Georges Creek Tyson | 3.10@3.25 | 3.10@3.25 | 3.10@3.25 | 1.60@1.80 |
| Clearfield: Medium | 3.00@3.10 | 3.00@3.10 | ..... | 1.45@1.55 |
| South Forks | 3.10@3.20 | ..... | ..... | 1.55@1.65 |
| Nanty Glo | 3.10@3.20 | ..... | ..... | 1.55@1.65 |
| Somerset County: Medium | 2.90@3.00 | 2.90@3.00 | 2.90@3.00 | 1.35@1.45 |
| Quemahoning | ..... | 3.00@3.10 | 3.00@3.10 | 1.45@1.55 |
| West Virginia Fairmont ¾ | ..... | 2.80@2.90 | 2.80@2.90 | 1.00@1.10 |
| Fairmont mine run | ..... | 2.70@2.80 | 2.70@2.80 | .90@1.00 |
| Western Maryland | ..... | 2.60@2.70 | 2.60@2.70 | 1.05@1.15 |

## PHILADELPHIA

**Anthracite has a fair volume of orders. Rumors of price agreements on family coal and talk of a change in sizes continues. Boiler size held up. Bituminous prices advance on Fairmont grades due to strike. Other quotations stationary.**

**Anthracite**—The shippers have a fair amount of business on hand, but there is no rush, and all requisitions can be promptly filled. The large retail dealers claim to have many orders but are not making the effort of other years to urge deliveries. However, the opinion is general that they will not be compelled to pay the July and August circular rates for coal bought during those months, so they are not stocking to the capacity of their yards. The retail men have as little faith in the shippers being able to hold the full prices as the shippers seem to have in each other. A number of deals on prepared sizes, protecting special prices until September, are known to have been consummated and many more will likely be made.

Egg, stove and chestnut are the most active sizes, with prices fairly firm, except to a few large buyers, and at least one company is actually short of stove. Pea sales are unusually light on account of the large stocks bought during February and March, much of which still remains in the dealers' yards. This and No. 1 buckwheat will be the principal sizes attacked by the price cutters in the next two months.

The large companies are having some difficulty in closing up their usual tonnage of broken with the gas companies, as with the new contract figure of $3.50 many of the companies state they are going to use coke.

With all the cutting in buckwheat coal the favorite figure for this size seems to be $1.40 and this figure would close most of the doubtful contracts now pending if it were offered by the larger companies.

The prices per gross ton f.o.b. cars at mines for line shipments and f.o.b. Port Richmond are as follows:

| | Line | Tide | | Line | Tide |
|---|---|---|---|---|---|
| Broken | $3.60 | $4.75 | Buckwheat | $1.65 | $2.55 |
| Egg | 3.85 | 4.95 | Rice | 1.00 | .... |
| Stove | 4.10 | 5.20 | Boiler | .90 | 1.80 |
| Chestnut | 4.20 | 5.25 | Barley | .75 | .... |
| Pea | 2.50 | 3.40 | | | |

**Bituminous**—The unexpected and substantial increase in the prices of Fairmont coals, especially the slack grades, surprised the market this week. The advances ranged from 5c. on the three-quarter gas and mine-run, to 35c. on slack. The rise was occasioned by the strike in the Pittsburgh district, where many of the mines are operated by the steel plants and in order to keep their mills from suspending they

went into the Fairmont district and bought the entire production of many mines. While the other grades sold in this market have not as yet been affected, there is no doubt that they will advance if the trouble in the Pittsburgh district is not promptly settled.

The following are prices per gross ton prevailing at the present time:

| | | | |
|---|---|---|---|
| Georges Creek Big Vein.. | $1.90@2 00 | Fairmont gas, ¾ ..... | $1.55@1.65 |
| South Fork Miller Vein.. | 1.70@1.80 | Fairmont gas, mine-run.. | 1.40@1.50 |
| Clearfield (ordinary)..... | 1.35@1.45 | Fairmont gas, slack..... | 1.25@1.35 |
| Somerset (ordinary)..... | 1.30@1.40 | Fairmont lump, ordinary. | 1.35@1.45 |
| West Va. Freeport..... | 1.15@1.25 | Fairmont mine-run..... | 1.25@1.35 |
| | | Fairmont slack..... | 1.25@1.35 |

### BALTIMORE

**Anthracite business very flat. Labor troubles stimulate demand for gas coals and force prices up.**

**Anthracite**—May was unusually dull, even after the low price schedule of the season was announced. This schedule will last through June, and the result is that consumers are not hurrying. It will be well toward the end of the month, or in July, after a ten cent advance before the trade expects many orders.

**Bituminous**—Demand for all kinds of coal in this section is only moderate and there is more than enough on hand to meet it. There is no unusual congestion, however, except for the fact that railroad sidings between Baltimore and the mines are pretty well clogged with loaded coal cars. West Virginia gas coals continue to boom under the extra demand from Pittsburgh operators in order not to disappoint customers. Should the men remain out in the Pittsburgh district, the gas coal region will find itself taxed to meet the extra demand.

Prices to the trade at the mines are about as follows: Georges Creek Tyson, $1.75; Miller vein, $1.55; Quemahoning, $1.60; Somerset, $1.50; Freeport, $1.10; Fairmont gas, three-quarter, $1.25@1.30; same, run-mine, $1.25; slack, $1.20.

Export movement was but fair last week. The total shipment to foreign ports from Baltimore was 13,266 tons, of which Cuba took 9,472 tons and Italy the balance.

### HAMPTON ROADS

**Heavy demand off-shore, particularly from South America, due to scarcity of British coals. Coastwise movement light.**

The continuation of the recent heavy export movement particularly to South America, is the feature of the market. The scarcity of coal at the British loading ports is responsible in a large measure for this increased tonnage. Shippers are awaiting, with interest, the action of the British Government in regard to the request of the British colliery owners that the workings of the eight-hour law be modified. Should the mining day be lengthened, the British output would be accordingly increased, resulting in larger exports to markets now being served by American coal.

Coastwise movement is comparatively light, though steady, the bulk of the tonnage being on contract business. There was some slight congestion at the piers for a few days, due to an unusual number of vessels reporting at the same time. With the exceptional facilities for loading, however, this condition was rapidly overcome, and despatch is now excellent.

Stocks are light, and prices per long ton f.o.b. vessel are firm as follows: Pocahontas, $2.85@3; New River, $2.85 @3; bunker coal, $3.30 (plus 10c. trimming).

Summer prices on anthracite effective June 1 for local delivery are per ton of 2,240 lb. delivered: Furnace, $7.50; egg, $7.50; stove, $7.50; nut, $7.50; pea, $6; buckwheat, $4.50.

Pocahontas and New River mine-run is $4.50 per short ton delivered and in car load lots, $2.75 on track. Other prices per short ton f.o.b. mines are:

| | June | July | August |
|---|---|---|---|
| Block (Splint) ..... | $1.60@1.70 | $1.75@1.85 | $1.85@1.95 |
| Egg (Splint) ..... | $1.25@1.35 | $1.35@1.45 | $1.50@1.60 |

The contract for the requirements of the National Soldiers Home for the fiscal year beginning July 1, estimated at 10,000 tons, has been awarded to Castner, Curran & Bullitt, Inc., at $2.9325 per long ton delivered for New River mine-run.

Total dumpings at the Hampton Roads piers for the month of May were: Norfolk & Western Ry., 678,110 tons; Virginian Railway, 369,196; Chesapeake & Ohio Ry., 446,818; total, 1,494,124 tons. May dumpings are approximately 150,000 tons greater than the month of April, and 400,000 tons greater than May of last year. It is interesting to note in this connection that the dumping of the Norfolk & Western Ry. for the month of May, 25 years ago, aggregated 122,367 tons.

**Railroad Tonnages**—Dumpings over the local piers for the past five weeks compare as follows:

| | Week Ending | | | | |
|---|---|---|---|---|---|
| Railroad | May 6 | May 13 | May 20 | May 27 | June 3 |
| Norfolk & Western.... | 159,875 | 110,696 | 181,338 | 160,173 | 190,408 |
| Chesapeake & Ohio.... | 110,108 | 95,974 | 104,703 | 93,804 | 100,140 |
| Virginian..... | 58,846 | 95,198 | 95,799 | 79,268 | 67,196 |
| Totals..... | 328,829 | 301,868 | 381,840 | 323,245 | 357,744 |

## Ocean Charters and Freights

### OCEAN CHARTERS

Coal freight charters have been reported as follows:

VIRGINIA

| Vessel | Destination | Tons | Rate |
|---|---|---|---|
| Skogstad | Barbadoes | 2,357 | |
| E. J. Lawrence | R. Janeiro | 2,483 | $18.00 |
| G. H. Ames | Bermuda | 378 | 4.50 |
| Melrose | R. Janeiro | 3,391 | |
| N. M. Porcella | Bermuda | 466 | 4.25 |
| Elswick L. | R. Plate | 2,300 | 20.40 |

PHILADELPHIA

| | | | |
|---|---|---|---|
| E.R.Hedretter | Martinique | 2,000 | |
| J. G. McCullough | Cuba | 2,500 | |
| E. G. Farrar | Martinique | 850 | |

BALTIMORE

| Vessel | Destination | Tons | Rate |
|---|---|---|---|
| Bryssel | Cuba | 1,829 | |
| Arna | S. Francisco | 3,250 | $8.50 |
| Adriatico | Barcelona | 1,783 | |
| Claveresk | Felton | 2,441 | |
| Tellus | Cuba | 4,182 | |
| Richmond | Nassau | 265 | 6.00 |

NEW YORK

| | | | |
|---|---|---|---|
| Lillian H. | St. John, N. B. | 424 | $3.00 |
| Allanwilde | Halifax, N. S. | 396 | 3.00 |
| Percy B. | Sackville | 289 | 3.50 |

### VESSEL CLEARANCES

The following steamers have cleared from various ports:

NORFOLK

| Vessel | Destination | Tons |
|---|---|---|
| F. Howard[5] | St. M., Azores | 1,346 |
| Maria C.[12] | Genoa, Italy | 3,401 |
| E. B. Douglas[2] | San Juan, P. R. | 1,612 |
| Columbian[13] | Rio de Janeiro | 10,659 |
| L. H. Goward[13] | Pernambuco | 1,750 |
| L. K. Thurlow[8] | P. Morant, Jamaica | 4,364 |
| Appolonia[12] | Genoa, Italy | 2,824 |
| Clara[12] | P. Ferrajo, Italy | 6,187 |
| Ulyssess[1] | Cristobal, C. Z. | 11,804 |
| Matea[12] | Santiago, Cuba | 2,760 |
| Poviga[12] | Genoa, Italy | 4,318 |
| Alaskan[13] | Rio de Janeiro | 11,043 |
| A. C. Barbour[2] | San Juan, P. R. | 1,729 |
| Circe[10] | Italy* | 3,856 |
| Trevalgan[7] | Buenos Aires | 5,876 |
| E. Parodi[11] | Italy* | 5,664 |
| Pontiac[6] | La Plata, A. R. | 4,144 |
| Wimborne[17] | Buenos Aires | 7,700 |
| Bolgen[17] | Buenos Aires | 2,349 |
| Lundy[2] | Rosario, A. R. | 4,090 |
| P. Transport[2] | Havana, Cuba | 7,398 |
| Penobscot[6] | Kingston | 3,445 |
| M. L. Urann[13] | Pernambuco | 2,561 |
| Skogstad[13] | Barbadoes, B.W.I. | 5,576 |
| Radcliffe[10] | Genoa, Italy | 7,344 |
| Corinthian[18] | Nassau, N. P. | 335 |
| Berwick Law[2] | Montevideo | 6,215 |
| Torrington[12] | Genoa, Italy | 6,271 |
| Frankby[9] | Mejillones, Chile | 6,264 |
| L. Accame[12] | Bagnoli, Italy | 4,322 |
| Luigi Ciampa[12] | Leghorn, Italy | 4,624 |
| Atlantide[12] | P. Ferrajo, Italy | 7,673 |

NEWPORT NEWS

| Vessel | Destination | Tons |
|---|---|---|
| Tallac[4] | Santiago, Cuba | 1,555 |
| C. Radcliffe[14] | Genoa, Italy | 8,920 |
| Rockpool[4] | Montevideo | 6,317 |
| Brynhilda[17] | Buenos Aires | 2,409 |
| O. Grange[4] | Havana, Cuba | 7,549 |
| G. D. Edmonds[4] | Santiago, Cuba | 785 |
| Munalbro[4] | Havana, Cuba | 5,871 |
| Barden[4] | Cardenas, Cuba | 536 |
| Nordland[4] | Cardenas, Cuba | 1,923 |
| Venus[11] | Italy* | 5,222 |
| American[4] | Rio de Janeiro | 7,096 |
| Trevethoe[7] | Montevideo | 5,778 |
| M. Goulandris[4] | Rio de Janeiro | 4,905 |
| Artisan[4] | Arica, Chile | 8,535 |

PHILADELPHIA

| | | |
|---|---|---|
| R. M. Walls | Dartmouth | |
| Bluefields | Jucaro | |
| A. J. Trainer | Calais | |
| M. E. Harper | Havana | |
| Rio Blanco | Rio Janeiro | |
| Ocland | F. de France | 1,874 |
| Josey | Antilla | |
| Edith Wolden | Montevideo | |
| Canada | Belize | |
| Coahuila** | Cienfugeos | |
| Francis Hyde | St. Croix | 338 |
| Tijuca | Lisbon | |
| Jethou | Rio Janeiro | 2,781 |

BALTIMORE

| | | |
|---|---|---|
| Loveland | Cuba | 3,422 |
| Claveresk | Cuba | 6,050 |
| Ausiliatrice | Italy | 2,133 |
| Mascotte | Italy | 1,661 |

[1] Atwater & Co.
[2] Baker Whiteley
[3] Barber & Co.
[4] Berwind-White
[5] C. G. Blake Co.
[6] Castner, Curran & Bullitt
[7] Chesapeake & Ohio C. & C. Co.
[8] Crozer-Pocahontas Co.
[9] Hasler Brothers
[10] Flat Top Fuel Co.
[11] New River Coal Co.
[12] Pocahontas Fuel Co.
[13] Smokeless Fuel Co.
[14] C. H. Sprague & Son
[15] Maryland C. & C. Co.
[16] White Oak Coal Co.
[17] Chesapeake & Ohio Coal Agency Co.
[18] Houston Coal Co.

* To Gibraltar for orders. ** Coal and Coke.

### OCEAN FREIGHTS

Freight rates are slightly easier than a week ago, owing to the increasing amount of tonnage offering, and the scarcity of export coal orders. None of the export coal charters made in the recent past have been reported.

| To | Rate | To | Rate |
|---|---|---|---|
| Havana | $4.50@5.00 | Bermuda | $4.50@5.00 |
| Cardenas or Sagua | 6.25 about | Vera Cruz | 6.00@6.50 |
| Cienfuegos | 6.00@6.50 | Tampico | 6.00@6.50 |
| Port au Spain, Trinidad | 6.75 about | Rio Janeiro | 19.00 about |
| St. Lucia | 6.75 about | Santos* | [1]19.50@20.00 |
| St. Thomas | 6.25@6.50 | Montevideo | 20.40 about |
| Barbados | 6.75 about | BuenosAires orLa Plata | 20.40 about |
| Kingston | 6.50 about | Rosario | 21.60 about |
| Curacao | [2]6.25@6.50 | West Coast of Italy | 33.60 about |
| Santiago | 6.00@6.50 | Barcelona*** | 30.00 about |
| Guantanamo | 6.00@6.50 | Chile (good port) | [1]15.00 |
| Demerara | | Marseilles | 32.40 about |

* Consignees paying dockage dues. ** Spanish dues for account of cargo.

[1] 500 tons discharge. [2] 400 tons discharge. [3] And p.c. [4] Net, 1,000 tons discharge. [5] Or other good Spanish port.

W. W. Battie & Co.'s Coal Trade Freight Report.

### COASTWISE FREIGHTS

There is no appreciable increase in the supply of tonnage and the coal trade is still hampered by the shortage. Rates are firm and so far as reported nothing less than $2 to Boston or $1.80 to Providence or other Sound ports from Hampton Roads has been accepted. From New York to Boston $1.35@1.40 is still the current basis, and $2 is the minimum for points east of the Penobscot. On Long Island sound for New York loading freights are still 80c.@90c.

# LAKE MARKETS

## PITTSBURGH

**Definite steps taken to reach an agreement in the labor difficulties. Partial resumptions. West Virginia coal an important factor in the Pittsburgh district.**

There will be a meeting on Monday, June 12, at which the National officials of the miners will endeavor to settle the strike issues and meanwhile the miners can return to work and their wages will be subject to the final settlement. Seven mines resumed work Tuesday but at several other mines the men voted not to return until settlement is effected and other votes were to be taken. In the meantime buying was practically suspended and there were offerings of West Virginia coal at delivered prices equivalent to $1.75 f.o.b. mine Pittsburgh district. Slack was fully as high if not higher.

The non-union mines together with the very few union mines operating, are engaged almost exclusively in shipping coal on contracts for the Lake trade and to regular consumers, so that there is scarcely any Pittsburgh district coal offered in the market. A very few of the lower Connellsville coke operators have the regular 38c. freight to Pittsburgh, while others must pay a 15c. arbitrary. These operators were disposed to assume upon the starting of the strike that they would have the market largely in their own hands, but West Virginia competition was quickly developed, with a 75c. rate to Pittsburgh and there seems to be an almost unlimited supply to come from West Virginia.

A feature of the situation is that on account of the light shipments in the Lake trade, and consequent light production of slack, almost as high prices will be paid for slack as for mine-run. There are no negotiations on contract as it is to be presumed operators would demand the circular price of $1.50, and perhaps more. We quote prompt coal rather irregular, as follows: Slack, $1.65@1.90; mine-run, $1.75@2; ¾-in., $1.85@2.10; 1¼-in., $1.95@2.15, f.o.b. mine, Pittsburgh district, the market, however, being really made chiefly by delivered prices from other districts.

## BUFFALO

**No surplus bituminous. Anthracite scarce. Strikes increasing. Surplus running down.**

**Bituminous**—It is a stand-off as to the future of the trade. The many strikes, especially in the Pittsburgh district, have cut off the supply of certain jobbers so that they are hardly able to fill their contracts. If they have sold gas coal they are in bad straits and have to buy Westmoreland or some sort of Ohio coal, which is not a rich gas producer as a rule. The Allegheny Valley miners are not striking as a rule, but they are not working actively and production is light.

All this is favorable to firm prices. The reports each day are that the Pittsburgh strikes are soon to be settled, but quiet letters from old operators take the opposite view quite often. There are few single orders, but the contracts are taking coal well. Prices are usually firm and most of the Ohio coal coming in is selling at good figures. The consumer's stocks are running down, so that if the men stay out the high prices paid here and there for special grades of coal will become more general soon.

At the same time the consumer is not disturbed and refuses to make any effort to stock up. The jobber is urging his coal forward and is in doubt which way the market will turn.

The following price schedule, based on the figures furnished this market by leading shippers in the Pittsburgh district, holds well, with slack stronger than sizes:

| | Pittsburgh | Allegheny Valley | Penn Smokeless |
|---|---|---|---|
| Lump | $2.95 | $2.75 | $2.80 |
| Three-quarter | 2.85 | 2.60 | ..... |
| Mine run | 2.75 | 2.50 | 2.60 |
| Slack | 2.40 | 2.30 | 2.60 |

Prices are per net ton, except east of Rochester and Kingston, Ont., where they are per gross ton.

**Anthracite**—The trade is getting slowly on its feet, but is hardly normal yet. Coal is not plentiful, so the operators do not appear to be anxious and the consumers are buying sparingly. After the April reduction is past the demand is always light till fall, unless there is some scare to urge buying. The smaller sizes move slow, the demand being for furnace grades mainly. Local dealers report a steady improvement in sales, but they do not expect to get back to normal before fall. The movement of independent anthracite is as light as any, prices being about on a par with the regular circular. The amount of this coal coming this way steadily increases. The June circular appeared regularly and is as follows for this market, f.o.b. per gross ton:

| | | | |
|---|---|---|---|
| Grate | $5.85 | Chestnut | $6.35 |
| Egg | 6.10 | Pea | 5.00 |
| Stove | 6.10 | Buckwheat | 3.50 |

For putting on board vessels 25c. gross is added. A reduction of 30c. per ton is allowed for June delivery.

Lake shipments are only about half the former average, for May, being to June 1, 561,396 net tons, as compared with 803,142 tons to the same date last season. For the week the clearances were 59,850 tons, of which 22,400 tons cleared for Duluth and Superior, 22,400 tons for Chicago, 6,100 tons for Milwaukee, 2,700 tons for Lake Linden, 2,500 tons for Fort William, 2,500 tons for Sault (Mich.), 1,800 tons for Sheboygan 1,750 tons for Sault, Ont.

## COLUMBUS

**Strength is shown in all departments. An advance in retail prices, preparatory to the stocking season.**

The trade during the past week has been strong and active in every way. Demand for Lake, steam and railroad purposes has been steady and circular prices are generally well maintained. The tone of the market is satisfactory in every way and future prospects are considered bright. Operators as well as jobbers are preparing for a good season from this time on.

Contracting for steam tonnage is now attracting attention. Quite a few contracts are expiring and renewals are in order. Prices are considerably higher than prevailed a year ago. Practically no tonnage is now contracted for under $1.20 for mine-run; $1.35 for three-quarter inch and 85c. for the small sizes. Railroads are taking a considerable tonnage for the movement of trains. Manufacturing establishments have used up their surplus stocks and are now buying in larger quantities.

Domestic trade is beginning to show activity. Dealers have cleaned up their stocks and are ready to start stocking in limited quantities. There is a good demand for Pocahontas and West Virginia splints. The demand for Hocking lump is not yet strong as it is too early for the expected spurt. An advance in retail prices has been recorded since June 1. Pocahontas lump is now selling around $4.25 and mine-run at $3.50. West Virginia splints are selling at $3.50 and Hocking lump is strong at $3.25.

There is still some shortage of cars in the eastern Ohio fields, which has the effect of curtailing production at the mines. Some shortage is also reported from West Virginia.

The Lake trade is growing more active, although there is considerable complaint of scarcity of boats. A considerable tonnage is moving from Ohio and West Virginia mines to the Northwest. The dock situation is satisfactory.

| | Hocking | Pomeroy | East Ohio | | Hocking | Pomeroy | East Ohio |
|---|---|---|---|---|---|---|---|
| Re-screened lump | $1.60 | $1.70 | ..... | Egg | $1.30 | $1.35 | .... |
| Inch and a quarter | 1.50 | 1.50 | $1.40 | Mine-run | 1.20 | 1.20 | $1.15 |
| Three-quarter-inch | 1.40 | 1.40 | 1.30 | Nut, pea and slack | .85 | .85 | .80 |
| Nut | 1.30 | 1.30 | ..... | Coarse slack | .75 | .75 | .70 |

## DETROIT

**Steam coal orders less than expected. Improvement in the domestic trade is slow. Few carriers available in Lake trade.**

**Bituminous**—Steam coal consumers appear reluctant to place orders for more coal than is required for current needs and the buying is less active than wholesalers had expected. Nut, pea and slack is the most active and prices hold around 90c. Mine-run interests a small proportion of the buyers and is quoted at $1 to $1.15 at the mines. Buying is also light in the domestic trade and retail dealers show no haste to cover their winter requirements. The amount of consignment coal on tracks is not excessive and the fine coal, is not just now occasioning much trouble, though the larger grades are more difficult to place.

**Anthracite**—Neither consumers nor retailers have started to stock up with anthracite to any marked degree though a few orders are being given by the retail yards. Congestion of freight in the East and lack of cars are blamed for irregularity of delivery.

**Lake Trade**—Active conditions in other branches of the Lake trade, which have resulted in a rate of $1 a ton on iron ore shipments from ports at the head of Lake Superior, leave few freighters available to carry coal. Slow arrival of coal at loading docks adds to the troubles of the shippers; even vessels under contract will depart without cargoes rather than incur delay.

## CINCINNATI

**Market sluggish, with little demand in any department, but prices steady. Restricted Lake movement due to limited cargo space. Car supply still inadequate.**

While the market has continued rather inactive there has been no substantial concession in prices, and such contracts as are closed are at satisfactory advances over last year's figures. The Lake movement is being hampered by the de-

mand for boats for ore cargoes, but this is compensated for very largely by shortage at the mines both of labor and cars, so that prices are well maintained. The car shortage is not as pronounced as it has been, but the supply is still inadequate to the needs of the mines. Domestic buying by retailers is not active, the tendency being to await developments. The steam demand is fair, and prices for nut and slack range around 80c., with mine-run 20 to 25c. higher per long ton f.o.b. mines. Indications are that the market will improve.

### LOUISVILLE

**Steam coals leading the market. Trade quieter both east and west. June prices in effect at an advance of about ten cents.**

In both the Eastern and Western Kentucky fields the steam coals are leading the market. No developments of importance are reported from the zone where the strike is on in Western Kentucky and prices are showing no effect. June prices have been scheduled, although it is stated that they are not invariably adhered to on sales.

Shipments in the Lake trade are absorbing some little tonnage from this district, but not so much as would be the case were the car supply easier and vessels more plentiful.

Eastern Kentucky mines quote prices, long ton basis, f.o.b. mines, about as follows: Block, $1.60; 2-in. lump, $1.45; two 2x4-in. round, $1.30; 6-in. mine-run, $1; nut and slack 80c. Nut and slack is the active Western Kentucky grade and sells at around 75c.

## COKE

### CONNELLSVILLE

**Furnace coke market stiffer. Not much Connellsville coal sold to Pittsburgh as result of strike. Production and shipments slightly increased.**

The coke market has visibly stiffened, prompt furnace having brought $2.75, while there are negotiations on second half contracts against which the operators are demanding $2.75, when contracts were made not very long ago at $2.50, though it is true that earlier in the year $3 was paid on two or three contracts. There were several sales of small lots of prompt made late last week at $2.75 and a sale of a small tonnage for delivery over the present week was made at the same figure. This week there has been scarcely anything done thus far, but there do not appear to be any offerings at less than $2.75, and not much at that figure.

Possibly the chief influence in stiffening the coke market has been the strike in the Pittsburgh coal district, which has led many operators to expect such a market for their raw coal that it would not pay to put coal into coke except at a good figure, $2.75 or more. Thus far, however, the actual sales of Connellsville coal for steam purposes have been very light, the West Virginia operators cutting more of a figure in the Pittsburgh coal market than was expected. Much is heard about merchant operators purposely restricting their output to contract requirements, so as to prevent any prompt coke from being offered in the market, but there is doubt whether tangible results are being secured by any such movement. Foundry coke is very quiet, with prompt offered at slightly lower figures than formerly. We quote: Prompt furnace, $2.75; contract, $2.50@2.75; prompt foundry, $3.25@3.50; contract, $3.50, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended May 27 at 436,812 tons, an increase of 2,371 tons, and shipments at 437,091 tons, an increase of 2,901 tons.

**Buffalo**—The market is firmer. Producers found that they could get better prices for coal and so reduced their oven operations till a reaction has begun to set in. Quotations are fairly strong at $5.10 for 72-hr. Connellsville foundry, $4.60 for 48-hr. furnace, $3.45 for high sulphur and $3.35 for stock.

**Chicago**—The demand for coke continues unabated at top notch figures. Even increased production of byproduct sizes is not sufficient to meet current requirements. The high range of prices now established are steadily maintained, being as follows per net ton f.o.b. cars Chicago: Connellsville, $6.00@6.25; Wise County, $6.25; byproduct foundry, $6.25@6.50; byproduct domestic, $4.60@4.70; gas house, $4.50@4.60.

**St. Louis**—The coke market has been rather quiet. Manufacturers and founderies have seemingly covered their requirements for the present and sellers on the other hand have sold all the coke that they can produce for the next two months. The local coke plants and all those selling byproduct coke are well sold up on the foundry sizes.

## MIDDLE WESTERN

### GENERAL REVIEW

**Bituminous domestic sizes quiet but steady. Steam grades continue strong. Anthracite shows a little more activity. Consignment coal of little consequence.**

The Western bituminous market has been comparatively quiet during the past week, although the demand for steam coal seems to be as pressing as ever. An increase in early buying is noticeable on the part of retailers taking Indiana coal, attracted by the lower prices prevailing for early summer deliveries; from the present attitude of the operators this coal will very likely show an orderly advance each month until winter arrives. Now that the new prices for anthracite have become public, the previous uncertainty has been removed, and there is a little more activity in the trade.

Prices on all sizes and grades of coal are being well maintained. Quite an active demand has sprung up for threshing coal and retailers show more of a disposition to place storage orders for domestic sizes. While some weakness appeared in fine coal during the middle of the week, caused by several large consuming interests restricting shipments, screenings still show great strength and prices have once more resumed their high range. Reduction in the amount of unbilled domestic lump on hand at Southern Illinois mines is reported.

Western mines are averaging about 50% working capacity, with coarse steam coal and fine sizes moving readily and coarse domestic sizes dragging. Some domestic shippers are finding disposition for their product in the industrial field. It is believed that the demand for coal in the Northwest will be much more than the docks can satisfy this year, and Illinois and Indiana operators look forward with confidence to increased shipments to that territory. The Lake situation still continues complicated owing to scarcity of vessels.

Owing to the policy now followed by the major producing interests of holding coal at the mines until marketable prices can be obtained, less consignment coal is being sent into Western trade centers than in many years past, and this is one of the chief factors in the maintenance of remunerative prices at a time when domestic demand is almost nil. It is generally felt among the Western coal trade that the Federal Trade Commission will not commence its investigation of bituminous coal trade conditions for at least sixty to ninety days.

### CHICAGO

**Steady call for steam varieties. Smokeless coals inclined to be firm. Anthracite stocking light. All prices well maintained.**

Franklin County domestic movement has improved. An increased tonnage is moving toward all Western points and this has reduced the accumulated domestic coal on hand somewhat. Outside of railroad shipments the Williamson County situation has not shown much betterment. Screenings from all Southern Illinois mines are steadily absorbed as fast as produced at the high figures prevalent. The Franklin and Williamson County operators are very optimistic over the outlook and believe that one of the best seasons in the history of the field is approaching. The demand for Carterville washed sizes for steam purposes is steady. A number of shipments are reported from Southern Illinois mines at the higher schedule of prices effective June 1.

Springfield domestic lump is very quiet, with lump for steam purposes moving forward in larger volume at prices ranging from $1.45 to $1.50. Screenings are also well taken from this district at around 85c. per ton.

But little spot smokeless is now on the market to be sacrificed, and prices in consequence are well held. Country trade is increasing, and pea size has shown more activity than the others. Pennsylvania smokeless is dormant, with but few shipments reaching Chicago, and changes in market conditions are slight.

But little Hocking coal is moving, but this bringing the full circular figures.

More activity in Eastern Kentucky grades is noticeable. Domestic prices have been advanced in the face of little demand. No Millers Creek is being shipped into this section. Screenings are softer and domestic sizes show some improvement.

The anthracite situation has settled down to normal proportions now that the new prices have been announced. The new circular did not take care of the freight advance made last August, and some jobbers and dealers believe they will have to absorb most of this advance themselves. It is felt that this will have a tendency to force the sale of anthracite coal into fewer hands. Very few sales agents are quoting prices for delivery beyond the current month.

Quotations in the Chicago market are as follows, per net ton f.o.b. car mines:

| | Williamson and Franklin Co. | Springfield | Sullivan Co. | Clinton | Knox and Greene Cos. |
|---|---|---|---|---|---|
| Lump | $1.45@1.55 | $1.50@1.60 | $1.60@1.70 | $1.60@1.65 | $1.50@1.60 |
| Steam lump | 1.35 | 1.35@1.40 | 1.35@1.45 | 1.30@1.35 | 1.35 |
| 2½ and 3-in. lump | .... | .... | 1.45@1.50 | .... | .... |
| 1¼-in. lump | .... | .... | 1.35@1.40 | 1.30@1.40 | 1.35@1.40 |
| Egg | 1.45@1.55 | 1.25@1.35 | 1.30@1.40 | 1.35@1.45 | 1.35@1.45 |
| Nut | 1.45@1.55 | 1.25@1.35 | 1.25@1.35 | 1.30@1.35 | 1.30@1.40 |
| No. 1 washed | 1.45@1.50 | .... | 1.80@1.85 | .... | .... |
| No. 2 washed | 1.35@1.40 | .... | 1.75 | .... | .... |
| No. 1 nut | 1.45@1.55 | .... | .... | .... | .... |
| No. 2 nut | 1.40@1.45 | .... | .... | .... | .... |
| Mine-run | 1.25@1.35 | 1.15@1.25 | 1.10@1.20 | 1.20@1.25 | 1.20@1.30 |
| Screenings | .90@1.00 | .90@ .95 | .85@ .95 | 90@1.00 | .90@1.00 |

| | Harrisburg & Saline Co. | E. Kentucky | Pocah. & W.Va.Smok'l. | Penna. Smokeless | Hocking |
|---|---|---|---|---|---|
| Lump | $1.45@1.55 | $1.50@2.00 | $1.60@1.75 | $1.50@1.75 | $1.70@1.75 |
| 1¼-in. lump | 1.30@1.35 | .... | .... | .... | 1.40@1.50 |
| Egg | 1.45@1.55 | 1.40@1.85 | 1.60@1.75 | 1.50@1.70 | 1.60@1.65 |
| Nut | 1.45@1.55 | 1.25@1.60 | 1.40@1.45 | 1.25@1.40 | .... |
| No. 1 nut | 1.40@1.50 | .... | .... | .... | .... |
| No. 2 nut | 1.40@1.45 | .... | .... | .... | .... |
| Mine-run | 1.25 | 1.25@1.30 | 1.15@1.25 | 1.15@1.25 | 1.25 |
| Screenings | 90@1.00 | .80@ .95 | .... | .... | .... |

Carterville Lump, $1.40@1.50, No. 1 washed, $1.45@1.55, No. 5 washed, $1.90@1.95; Kanawha splint lump, $1.40@1.50.

### ST. LOUIS

**Demand light but prices held close. Production heavily restricted.**

Coal is offered as low, and in some cases even lower than at this time last year, in spite of the advance in the mining scale which amounts to at least 10c. a ton. However, there is very little coal moving, as the market requirements seem only about 20% normal. Only a few operators and two or three coöperative mines are willing to accept the current prices, but the open market is so restricted at the present time that these operators are setting the pace.

In the high-grade district of Illinois conditions are quite satisfactory. The Franklin County operators stopped taking contracts from dealers on the first of June, and in spite of the fact that they stopped much earlier than usual, the amount of contract business on hand increased considerably. The lower grade coals are still being offered at contract prices.

The market is quotable on the following basis per net ton, f.o.b. mines:

| | Franklin County | William-son | Staunton and Mont-gomery | Inter-mediate | Stand-ard |
|---|---|---|---|---|---|
| 6-in. lump | $1.55 | $1.45 | $1.25 | $1.15 | $1.00 |
| 6x3-in. egg | 1.55 | 1.45 | 1.25 | 1.15 | 1.00 |
| 3x2-in. nut | 1.55 | 1.45 | 1.25 | 1.15 | .90 |
| No. 2 nut | 1.50 | 1.20 | 1.10 | 1.10 | .90 |
| No. 3 nut | 1.45 | ..... | ..... | ..... | ..... |
| No. 4 nut | 1.30 | ..... | ..... | ..... | ..... |
| No. 5 nut | .75 | ..... | ..... | ..... | ..... |
| Screenings | 1.00 | .90 | .90 | .85 | .80 |
| 2-in. lump | ..... | ..... | ..... | 1.00 | .80 |
| Steam egg | ..... | ..... | 1.15 | 1.00 | .80 |
| Mine-run | 1.25 | 1.15 | 1.15 | 1.00 | .80 |
| Washed | ..... | ..... | ..... | ..... | ..... |
| No. 1 nut | ..... | ..... | 1.55 | 1.50 | ..... | 1.30 |
| No. 2 nut | ..... | ..... | 1.40 | 1.30 | ..... | 1.20 |
| No. 3 nut | ..... | ..... | 1.25 | 1.10 | ..... | 1.10 |
| No. 4 pea | ..... | ..... | 1.25 | 1.10 | ..... | 1.00 |
| No. 5 slack | ..... | ..... | .70 | .75 | ..... | .75 |

## PRODUCTION AND TRANSPORTATION STATISTICS

### OUTPUT OF FRANKLIN COUNTY, ILLINOIS MINES

The following is a statement of tonnage produced by Franklin County, Illinois, mines by months during the two year periods ending Mar. 31:

| Month | 1915 | 1914 | Gain |
|---|---|---|---|
| April | 364,131 | 115,641 | 248,490 |
| May | 359,511 | 358,610 | 901 |
| June | 561,573 | 453,226 | 108,347 |
| July | 630,295 | 572,182 | 58,113 |
| August | 712,514 | 701,572 | 10,942 |
| September | 914,626 | 808,665 | 105,961 |
| October | 989,263 | 773,783 | 215,480 |
| November | 902,798 | 740,525 | 162,273 |
| December | 1,008,952 | 841,900 | 167,052 |
| | 1916 | 1915 | |
| January | 1,038,087 | 911,424 | 126,663 |
| February | 1,062,353 | 563,358 | 498,995 |
| March | 745,962 | 514,937 | 231,025 |
| Total | 9,290,065 | 7,355,823 | 1,934,242 |

Gain during period Apr. 1, 1915, to Mar. 31, 1916, over preceding year equals 1,934,242 tons.

### SAULT STE. MARIE CANALS

Coal shipments through the Sault Ste. Marie Canals for the month of April amounted to 606,398 tons. Of this amount 100,800 tons were anthracite and 505,598 tons were bituminous, 27,800 tons of the latter passing through the Canadian Canal.

### COAL MOVEMENT

Fuel shipments over 13 of the leading Eastern carriers for January and three months of 1914, 1915 and 1916 were as follows, in short tons:

| | October | | November | | January | |
|---|---|---|---|---|---|---|
| Anthracite | 1914 | 1915 | 1914 | 1915 | 1915 | 1916 |
| B. & O. | 127,394 | 173,613 | 126,769 | 139,416 | 109,890 | 158,703 |
| B. R. & P. | 12,324 | 14,281 | 13,137 | 14,170 | 14,365 | 17,179 |
| B. & Susq. | 939 | 1,175 | 1,120 | 1,282 | 874 | 887 |
| C. & O. | 1,289 | 1,734 | 1,229 | 1,122 | 839 | 1,284 |
| Erie | 953,416 | 914,736 | 731,966 | 914,850 | 740,710 | 859,718 |
| H., B. T. M. | ..... | 111 | 3 | 101 | 31 | 38 |
| Penn | 1,047,340 | 1,084,739 | 1,003,988 | 1,194,794 | 886,233 | 1,136,878 |
| P. S. & N. | 771 | 971 | 1,735 | 1,619 | 1,422 | 2,003 |
| Virginian | 61 | 163 | 166 | 191 | 98 | 273 |
| W. Md. | 25,008 | 40,217 | 28,445 | 35,213 | 25,808 | 34,788 |
| Total | 2,168,636 | 2,231,892 | 1,908,652 | 2,302,999 | 1,780,270 | 2,211,751 |
| Bituminous | | | | | | |
| B. & O. | 2,802,702 | 3,312,195 | 2,452,786 | 3,016,640 | 2,438,091 | 2,861,967 |
| B., R. & P. | 648,915 | 803,521 | 598,648 | 861,540 | 550,630 | 886,932 |
| B. & Susq. | 94,871 | 115,030 | 88,058 | 150,899 | 83,092 | 152,661 |
| C. & O. | 2,026,589 | 2,175,256 | 1,556,469 | 2,141,243 | 1,089,771 | 2,242,187 |
| Erie | 494,830 | 818,701 | 538,258 | 824,975 | 597,449 | 806,243 |
| H., B. T. M. | 84,785 | 120,951 | 81,794 | 126,609 | 79,157 | 105,842 |
| N. Y. C.[1] | 534,708 | 656,023 | 458,917 | 688,612 | 522,656 | 730,769 |
| N. & W. | 1,757,198 | 2,753,601 | 1,627,678 | 2,433,977 | 1,626,182 | 2,365,408 |
| Penn. | 3,976,192 | 4,304,466 | 3,446,436 | 4,307,041 | 3,498,936 | 4,314,806 |
| P. S. & N. | 192,449 | 300,501 | 213,206 | 291,920 | 225,285 | 232,736 |
| Virginian | 322,810 | 339,820 | 261,530 | 332,635 | 322,547 | 445,219 |
| W. Md. | 563,617 | 847,598 | 521,871 | 849,587 | 652,693 | 714,036 |
| Total | 14,334,606 | 17,755,196 | 12,455,001 | 17,107,538 | 12,286,489 | 15,858,806 |

[1] Buffalo and east.

### IMPORTS AND EXPORTS

The following is a comparative statement of coal imports and exports of the United States for March, 1915-16, and for the 9 months ending March, 1914-15-16, in long tons:

| | March | | Nine Months | | |
|---|---|---|---|---|---|
| Imports | 1915 | 1916 | 1914 | 1915 | 1916 |
| Anthracite, total | 7 | 36 | 1,014 | 12,132 | 7,165 |
| Bituminous, total | 124,479 | 147,477 | 1,040,540[1] | 1,084,028 | 1,260,665 |
| United Kingdom | 2,680 | 160 | 9,691 | 29,950 | 6,398 |
| Canada | 99,940 | 140,393 | 746,286 | 842,440 | 1,108,195 |
| Japan | 4,050 | ..... | 83,208 | 68,251 | 60,420 |
| Australia | 17,749 | 6,039 | 197,925 | 141,880 | 83,956 |
| Other countries | 60 | 885 | 3,430 | 1,507 | 1,696 |
| Coke | 4,909 | 6,392 | 82,175[1] | 79,700 | 43,281 |
| Exports | | | | | |
| Anthracite total | 127,195 | 309,955 | 2,654,106 | 2,453,331 | 2,694,277 |
| Canada | 124,114 | 301,620 | 2,607,383 | 2,411,403 | 2,588,222 |
| Argentina | 212 | ..... | ..... | 212 | 1,931 |
| Brazil | ..... | ..... | ..... | 6 | 2,472 |
| Uruguay | ..... | ..... | 84 | ..... | 600 |
| Other countries | 1,869 | 8,335 | 46,039 | 41,710 | 101,052 |
| Bituminous total | 692,854 | 1,069,218 | 12,663,550 | 9,962,640 | 13,456,897 |
| Italy | 72,371 | 142,323 | ..... | 706,960 | 2,196,516 |
| Canada | 273,395 | 546,307 | 9,577,352 | 6,581,129 | 7,203,537 |
| Panama | 47,600 | 26,957 | 281,394 | 218,397 | 385,600 |
| Mexico | 34,899 | 21,191 | 235,122 | 305,953 | 163,972 |
| Cuba | 110,585 | 116,195 | 902,437 | 781,559 | 921,697 |
| West Indies | 46,563 | 46,124 | 425,071 | 323,960 | 456,847 |
| Argentina | 33,404 | 60,780 | 99,388 | 217,797 | 482,705 |
| Brazil | 42,827 | 81,394 | 196,837 | 273,015 | 461,084 |
| Uruguay | 10,273 | 2,250 | 40,492 | 40,767 | 99,514 |
| Other countries | 20,937 | 25,697 | 905,457 | 513,103 | 1,085,425 |
| Total coal | 820,049 | 1,379,173 | 15,317,656 | 12,415,971 | 16,151,174 |
| Coke | 59,701 | 93,980 | 599,051 | 403,151 | 711,768 |
| Bunker coal | 579,027 | 562,267 | 5,754,530 | 5,031,390 | 5,492,714 |

[1] Part year only.

## FOREIGN MARKETS

### GREAT BRITAIN

**May 24**—For prompt shipment the pressure is as great as ever, but supplies are very scarce. Quotations are approximately as follows:

| | | | |
|---|---|---|---|
| Best Welsh steam | Nominal | Best Monmouthshires | $13.08@13.20 |
| Best seconds | Nominal | Seconds | 12.00@12.60 |
| Seconds | $12.96@13.20 | Best Cardiff smalls | 7.80@ 8.04 |
| Best dry coals | 11.52@12.48 | Cargo smalls | 6.00@ 6.72 |

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

**Freight**—Outward chartering is very restricted at present, and in view of the coming limitation of rates for France, is confined to prompt positions. Rates are approximately as follows:

| | | | | | |
|---|---|---|---|---|---|
| Gibraltar | $12.00 | Naples | $21.00 | St. Vincent | $12.60 |
| Marseilles | ..... | Alexandria | 27.00 | River Plate | 14 40 |
| Algiers | ..... | Port Said | 26.40 | | |
| Genoa | 21.00 | Las Palmas | 12.00 | | |